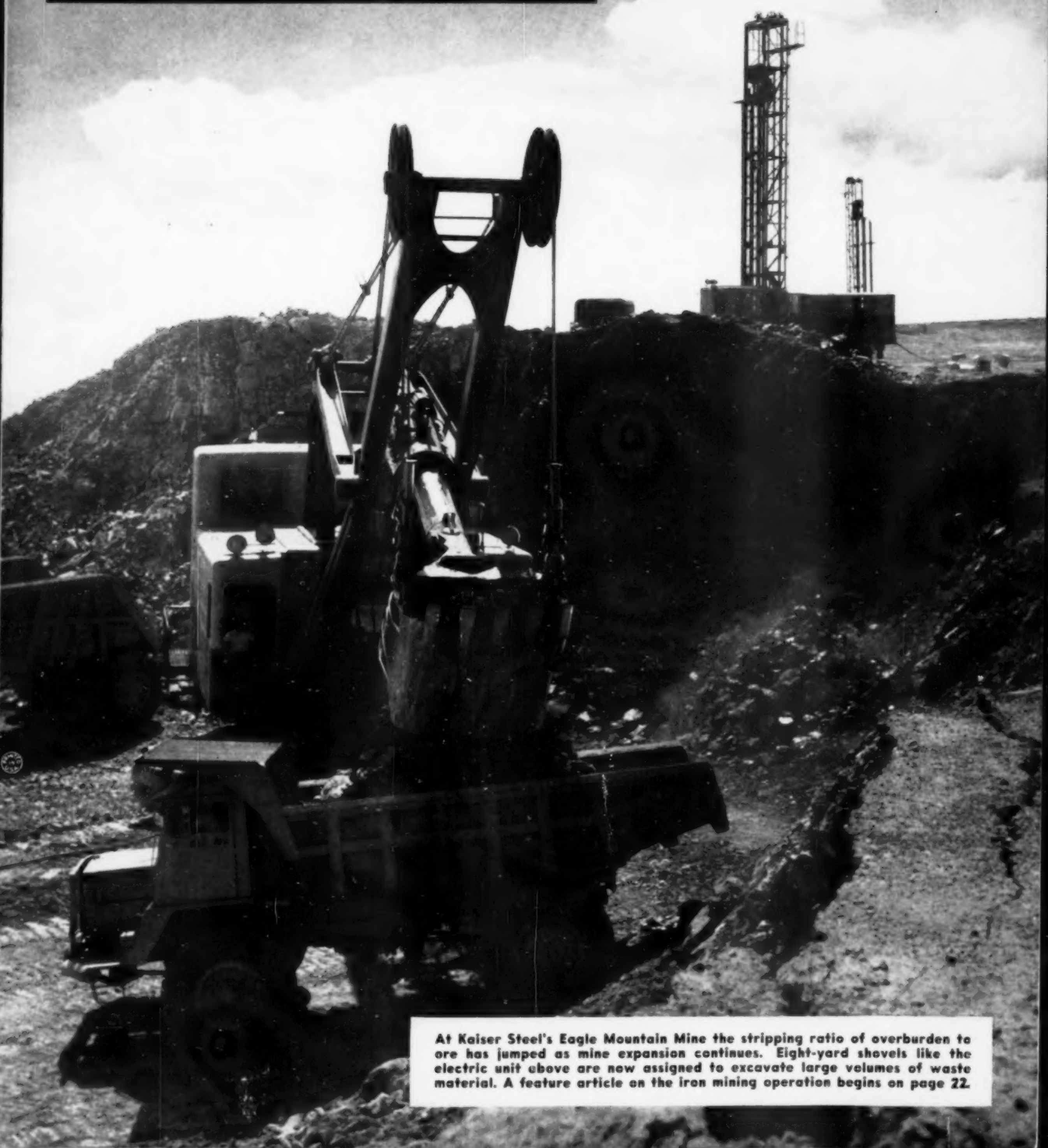
Excavating Engineer

founded 1905

SEPTEMBER 1958



At Kaiser Steel's Eagle Mountain Mine the stripping ratio of overburden to ore has jumped as mine expansion continues. Eight-yard shovels like the electric unit above are now assigned to excavate large volumes of waste material. A feature article on the iron mining operation begins on page 22.

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BUCYRUS ERIE
190-B

Chile Exploration Company Adds 71st Bucyrus-Erie At World's Largest Copper Mine

Chile Exploration Company recently added a 6th 8-yd. 190-B shovel to their production team at Chuquicamata — the 71st Bucyrus-Erie excavator or drill to go into operation at that mine since 1915.

Chuquicamata — largest of the world's known porphyry-type copper deposits — is located nearly two miles high in the Andes Mountains of Chile. At this widely discussed but remote location, Bucyrus-Erie electric shovels load both oxide and sulphide copper ores. Processing of the oxide ore by leaching and electrolyzing is a development which was pioneered at Chuquicamata.

The Bucyrus-Erie excavators maintain a continuous and economical flow of big yardages here as in other mines throughout the world. Some of the reasons behind the fine performance of these shovels are:

Heavy-duty construction throughout — keeps the shovel working, holds down maintenance, assures long service life.

Modern front-end design — combines great strength with light weight to boost payload ratio.

Ward Leonard variable voltage control — permits fast acceleration and deceleration, provides extra torque when needed for fast work cycles.

You, too, can enjoy these and many other advantages that Bucyrus-Erie electric shovels offer. Write now for complete information on the $4\frac{1}{2}$-yd. 110-B, 6-yd. 150-B, or 8-yd. 190-B heavy-duty excavators.

209L58C

MODERNIZE to economize!

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN

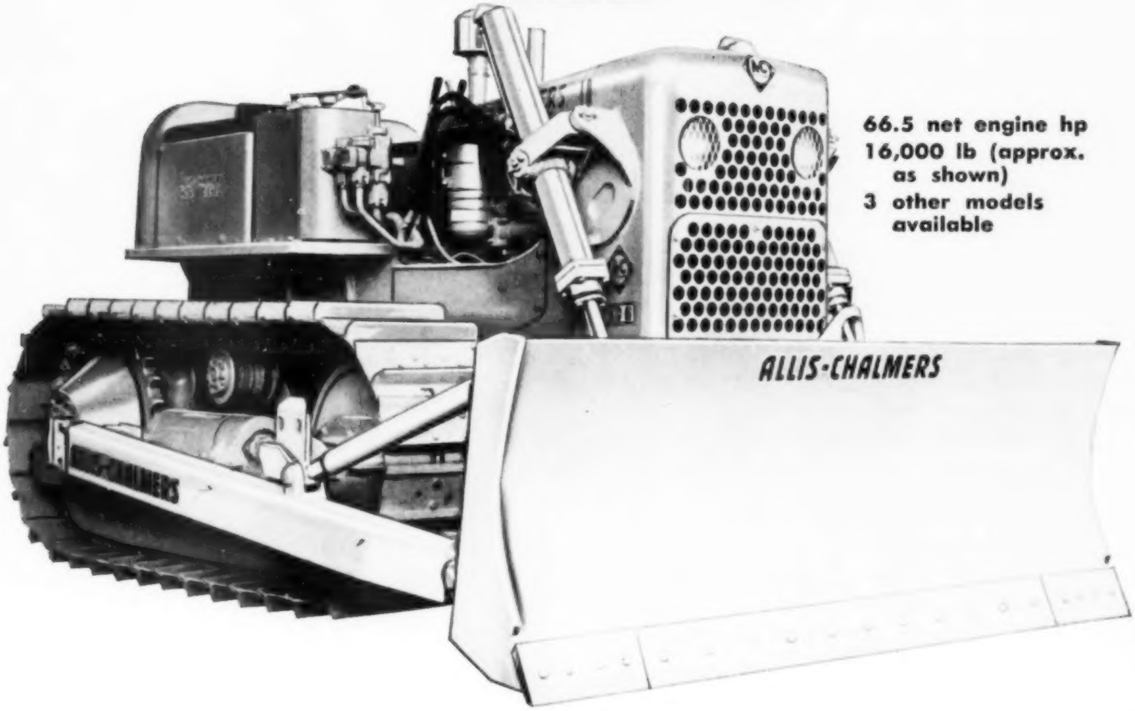
BUCYRUS ERIE

Authorized Distributors — the World Over

POWER for the job

PORTABLE without a permit

ALLIS-CHALMERS HD-6 Dozer



66.5 net engine hp
16,000 lb (approx. as shown)
3 other models available

Contractors find the Allis-Chalmers HD-6 measures up — both in performance and easy transport. It has the size, power and dependability to make money on all your earthmoving jobs.

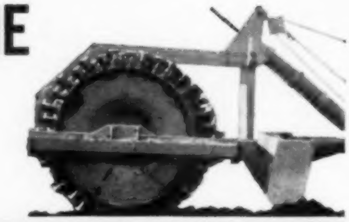
When traveling from job to job, there's no need to remove the dozer. The 8-ft. blade — legal width for highway travel — lets you load your HD-6 right onto a truck or trailer — travel quickly with no time lost.

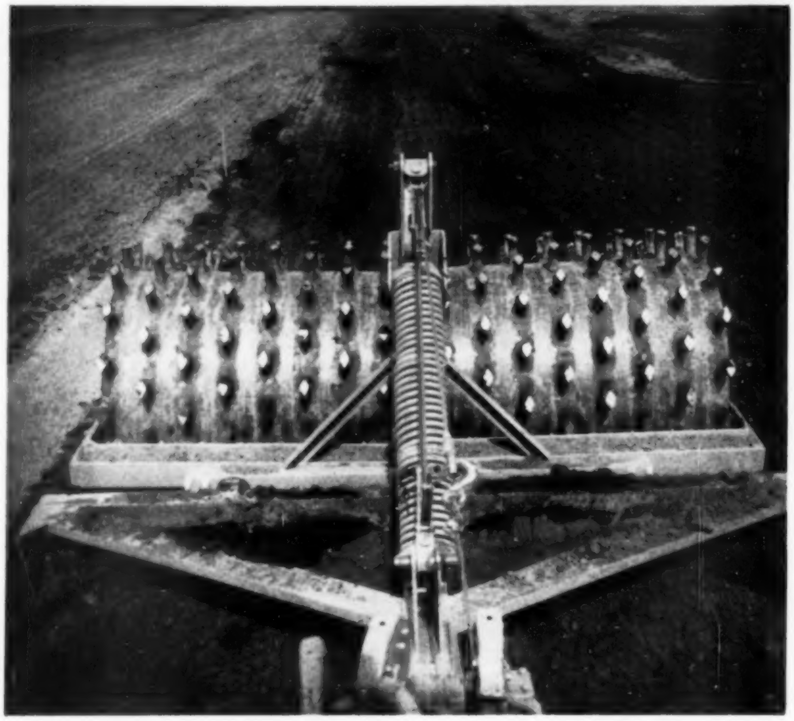
The HD-6 is a maintenance man's tractor. Even in mud, sand, rock and dust, Allis-Chalmers Positive Seals protect tapered roller bearings on truck wheels, idlers and support rollers. These smooth-running assemblies require lubrication only once every 1,000 hours — change greasing time to profitable work time.

There are many reasons why more and more contractors are using HD-6 dozer tractors. See your Allis-Chalmers dealer. He'll be glad to demonstrate on your job. Allis-Chalmers, Construction Machinery Division, **Milwaukee 1, Wisconsin.**

Look ahead... *move ahead*
...and stay ahead with **ALLIS-CHALMERS** A-C

LAST YEAR HE WOULDN'T OWN ONE —THIS YEAR HE BOUGHT TWO!





The BROS Leveling Tamping Roller* is such an uncomplicated piece of equipment that last year even big grading contractors like Alley Construction Co., of Faribault, Minn. couldn't quite visualize its real value on earthfill work.

But this year, Lloyd Parker, Alley's superintendent on the grading job for nearly a million yards at Wold-Chamberlain Airport in the Twin Cities, put a BROS G2 Roller-Level Blade combination on the job—the results were so good that he purchased a second unit the *very next day!*

You can easily see why: The Leveling Roller makes subgrade rolling a productive item because it produces uniform, proper densities faster than conventional tamping rollers can. The blade puts the materials into the voids, building a smooth, level course, permitting equal compaction pressure over the full width of the drum. Because the course is smooth and compaction is fast, scrapers can haul and spread at faster speeds, earning you greater profits.

The Leveling Blade has 14″ vertical adjustment which is controlled from the operator's seat by either hydraulic or cable control. The Leveling Roller is available in rolling capacities from 15,160 lbs. to 44,700 lbs. when roller drum is filled with wet sand.

Level Blade Attachments for your present BROS M2 and G2 Series Tamping Rollers are also available. M2 Blade Specifications: 112″ width; 24″ height; and ½″ x 6″ double bevel reversible high carbon steel cutting edge. G2 Blade Specifications: 141″ width; 31″ height; ⅝″ x 8″ square edge reversible high carbon steel cutting edge.

Get complete information on this new profit-making equipment from your nearest BROS Dealer or write us. World-wide sales and service.

*Patent Pending

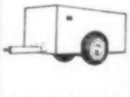
BROS *Incorporated*

ROAD MACHINERY DIVISION

1057 TENTH AVE. S.E.
MINNEAPOLIS 14, MINN.

Write today for the full report on the Ohio tests and for complete new literature describing the new BROS SP-730 pneumatic roller. It's free of cost or obligation!

SHEEPSFOOT TAMPERS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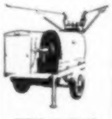
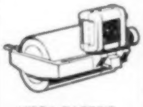

BITUMINOUS CIRCULATOR


VIBRA-PACTOR

9-TON SELF-PROPELLED ROLLER

9 AND 13-TON ROLLERS

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Excavating Engineer

founded 1905

South Milwaukee, Wisconsin

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Boost Blast Hole Footage with Bucyrus-Erie Rotaries

Blast hole footage increases fast when Bucyrus-Erie rotaries move in. Look over the capsule stories with the drills pictured. You'll see how important features helped these Bucyrus-Erie rotary users put down hole fast. You, too, can benefit from the high production of Bucyrus-Erie rotaries. These speedy rigs are available in two sizes — the full-electric 50-R for drilling 9⅞ to 12¼-in. holes, and the 40-R with either full-electric or diesel-electric power for drilling 6¾ to 9-in. holes. Write us today for illustrated bulletins. 78B58C

A Familiar Sign at Scenes of Progress

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN

WISCONSIN A 50-R cuts through tough, hard-to-drill quartz and granite at this quarry in northern Wisconsin. It achieves the greatest possible penetration in this hard rock because maximum down pressure can be exerted on the bit while the drill pipe is turning slowly. Hydraulic pulldown provides controlled load on drilling tools.

ONTARIO, CANADA The Ward Leonard variable voltage system on this 40-R gives the operator smooth, instant command over rotation of the drill pipe. He can choose the most efficient speed for a given formation. To meet requirements, he can vary the speed without stopping the drilling operation. The machine is drilling blast holes in construction of Lambert Lock on the St. Lawrence Seaway.

PENNSYLVANIA Quartzite segmented by fissures and seams makes drilling difficult at this Pennsylvania quarry. But when the 40-R drill shown here was put on the job, footage increased so noticeably that the 40-R was made a permanent part of the production set-up. One of the features that contribute to the 40-R's fine performance at this location is air bailing of cuttings. Compressed air cools the bit and cleans out cuttings, eliminating the need for water — especially important during cold weather. Heavies pile up adjacent to the hole, provide handy stemming material and permit dry sampling.

CALIFORNIA This 50-R drill is so speedy that it was able to replace two cable tool rigs and a rotary that had been working full time at a California cement quarry. Due to the fine performance of the 50-R at this quarry, a smaller 40-R was added to the production team. To speed progress, the 40-R drills continuously for 27 ft. 9 in. and the 50-R drills continuously for 32 ft. 9 in. — the full length of drill pipe.

the profit you left behind

There it lays in the dirt. Your machines and equipment ground off in the grit, pounded off in the rock. You can almost see the wear that shut down your machines too soon . . . idled your men too long . . . bled your profits too much.

Is there *one* material, *one* metal that can stop this excess wear waste?

One? It takes many alloys, engineered alloys (some you may never have heard of). It takes a list of Amsco® Alloys to span the entire range of wear applications.

Amsco Alloys that can work a full shift where severe abrasion knocked out toughest metals in three hours. Amsco Alloys that can belt rock all day, and work tomorrow, too. Amsco Alloys that can work any abrasion-impact combinations you face and still resist the wear, stop the waste . . . save the profit in the job.

When you need the *best* alloy for the job, you'll find it first among the Amsco Alloys . . . engineered by America's largest producer of cast manganese steel and specialists in wear-resistant metals.

AMERICAN
Brake Shoe
COMPANY

AMSCO

American Manganese Steel Division • Chicago Heights, Illinois

They cut a flood control job

with Allis-Chalmers construction machinery!

Don Cunningham Construction Co.—with a crack crew and a fleet of Allis-Chalmers construction machines—have set an outstanding record on a New Mexico soil conservation job. They completed a flood control project scheduled for 180 days in 75! It involved 325,000 yd of earth fill.

Don Cunningham gives major credit to his Allis-Chalmers fleet—motor scrapers, crawler tractors and motor grader. He's convinced that top machine availability and extreme ease of handling are the big reasons why men and equipment were able to maintain the record pace. Cunningham estimates profit on this contract will be 20 percent greater than figured in the original bid—a hefty bonus on any job!

Look ahead... *move ahead*...and stay ahead

A SURE-FIRE SUCCESS FORMULA!

The Cunningham Construction Company is proud of its reputation for high-production earth moving. Says Don Cunningham: "The combination of Allis-Chalmers' productive machines and a first-rate operating crew, teamed with the excellent service our dealer provides, amounts to *an unbeatable formula for sure profits in this industry.*"

The equipment spread includes four Allis-Chalmers motor scrapers—two TS-360's and two TS-260's—plus five turbocharged HD-21 crawler tractors. Two of the tractors are used as pushers, one as a dozer. Another HD-21 tows a four-gang sheepsfoot roller and the fifth pulls an 18-yd scraper. An Allis-Chalmers FORTY FIVE motor grader levels fill, keeps haul routes smooth for high-speed scraper cycles.

Big 120-horsepower FORTY FIVE motor grader blades fill at dam site, keeps pace with fast-moving equipment like the 20-yard TS-360 motor scraper at right.

The flood control job consists of building two dams and diversion dikes, moving an estimated 325,000 cu yd in the Dona Ana area north of Las Cruces, New Mexico. Working a 54-hour week, the 10-man crew moved nearly 200,000 yd in the first 4½ weeks. This impressive volume brought construction people from all over Texas and New Mexico to see the spread in action.

Don Cunningham, veteran of more than 30 years in earth moving, points out that such performance is a powerful factor in bringing in more construction jobs.

6-month to 2½

Don Cunningham
El Paso, Texas

Four Allis-Chalmers motor scrapers, push-loaded by 225-horsepower turbocharged, torque converter-equipped HD-21's, moved nearly a quarter of a million yards the first month, helped boost profits 20 percent for the whole job.

with ALLIS-CHALMERS

PREVENTIVE MAINTENANCE PAYS OFF AGAIN!

Chief mechanic, "Snuffy" Oliver, and his assistant have an effective preventive maintenance program, including daily inspection of tracks, fan belts, blowers, turbochargers, cables, clutches.

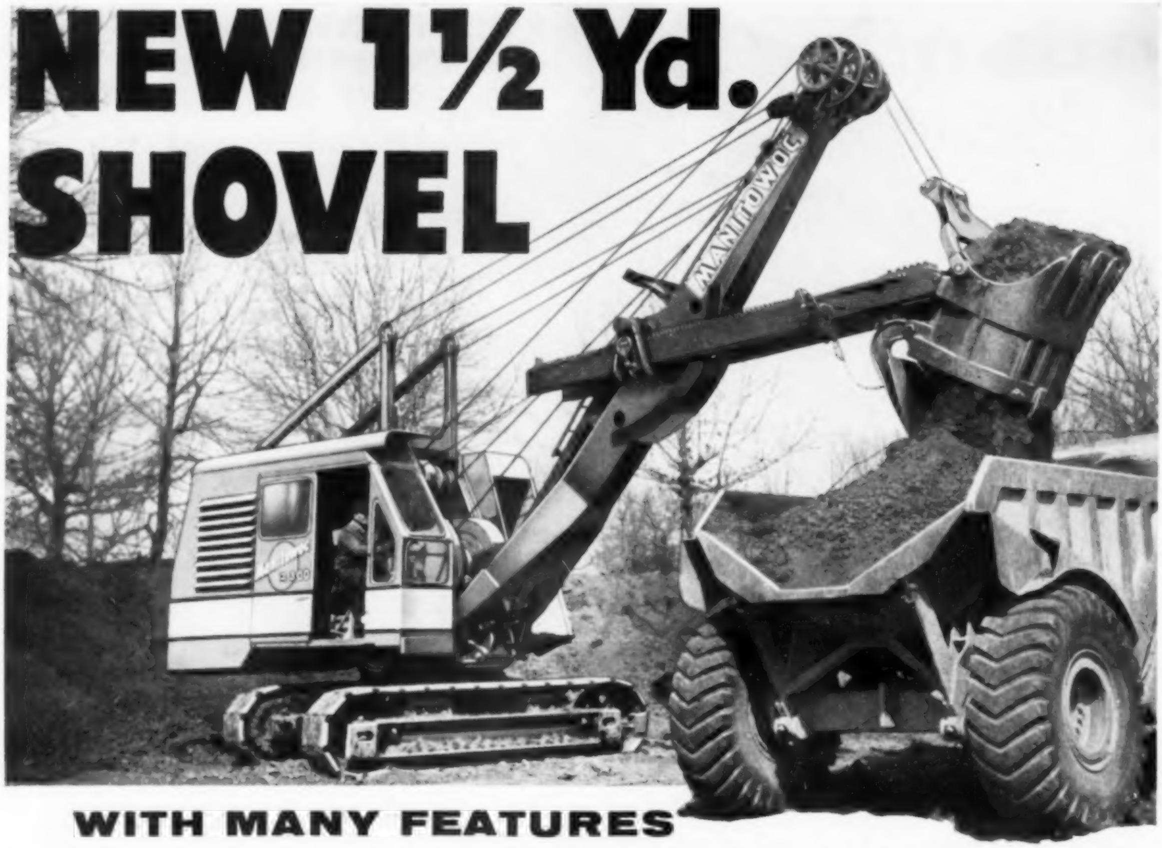
This regular maintenance keeps Cunningham's Allis-Chalmers fleet in first-class condition. Daily lubrication, servicing and inspection requires about 20 minutes a day for each machine. No other time was lost during the nine-hour working shift.

Compacting scraper-hauled fill, big HD-21 crawler tractor tows four-gang sheepsfoot roller.

The easy-service design of Allis-Chalmers crawler tractors, motor scrapers and motor graders speeds the preventive maintenance routine. For example, truck wheels, idlers and support rollers need lubrication only once every 1,000 operating hours. Time-saving convenience like this keeps every machine ready for action.

Whether your operations call for one unit or a fleet, you can get high production like this. Your Allis-Chalmers dealer will recommend the right equipment for your jobs—from a complete line of up-to-the-minute construction machinery. See him now and ask for a demonstration on your job. Allis-Chalmers, Construction Machinery Division, Milwaukee, Wisconsin.

NEW 1½ Yd. SHOVEL



WITH MANY FEATURES FOUND ONLY ON THE LARGEST MACHINES!

- ★ Simple, "Power-flo" Slide Pinion Drive . . . Only 11 Gears in Entire Upper Works
- ★ Faster Cycle Speeds
- ★ Air Cooled, Disc-Type Swing Clutch
- ★ Modern, Centralized Lubrication
- ★ Huge, 62" Ring Gear . . . Big 7½" King Pin — Largest in Its Class
- ★ Simplified Air Controls . . . Smooth Torque Converter
- ★ New, Easy Hydraulic Jack Adjustment for Proper Crawler Tensions

Move up to the Manitowoc 2300

The new, heavy, rugged Model 2300 delivers a *true* 1½-yd. capacity on any job you can name. You get smooth, powerful, steady performance in dirt or rock . . . as a big capacity shovel, a fast swinging dragline, or heavy-lifting crane.

For economical operation with less downtime; long machine life with high trade-in value; and complete versatility, the new 2300 is the ideal "key" machine for your equipment fleet.

You can make more money on today's jobs only if you have "today's" equipment . . . and the Manitowoc 2300 is as modern as tomorrow. Ask your distributor for literature and full specifications!

35 TON CRANE has a low center of gravity and solid stability. Precise, positive control . . . booms to 130'.

1½-YD TRENCH HOE cuts an 11' level bottom as deep as 32' without machine travel. Air controls and power brakes.

BIG CAPACITY DRAGLINE AND CLAM. Long reach dragline has 1½ - 2½ yd. capacity. Big output clam features fastest closing-hoisting speed.

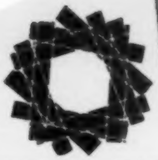
Manitowoc

MANITOWOC ENGINEERING CORP.
(A subsidiary of The Manitowoc Company, Inc.)
MANITOWOC, WISCONSIN

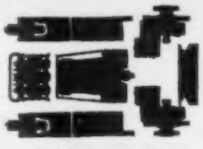
CRANES	SHOVELS	DRAGLINES	TRENCH HOES
20 TON - 100 TON	1-YD. - 5½-YD.	1-YD. - 6-YD.	1-YD. - 2½-YD.

CONTRACTORS CUT COSTS WITH EIMCOS'

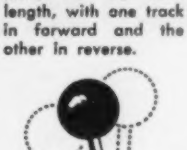
Move more earth at less cost with Eimco heavy-duty equipment



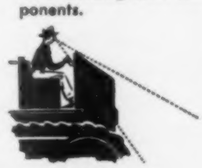
INDEPENDENT TRACK ASSEMBLY
Each track is powered and controlled separately — Tractor spin turns in it's own length, with one track in forward and the other in reverse.



UNIT ASSEMBLY
Each major tractor component is a separate assembly for easy maintenance or removal without disturbing other components.



INSTANT REVERSAL
No stopping, manual clutching or gear shifting to change directions — A pull on the track control levers immediately reverses the tractor.



FULL VISIBILITY
Up-front operators position eliminates all guess work in dozing, digging, pushing and loading operations.

Eimco heavy-duty earth moving machinery will permit lower bids on construction work.

Here are reports from a few jobs where Eimco equipment is being used:

1. Underground limestone quarry working an Eimco 105 on 2 levels to do all underground loading. — "Our maintenance parts and labor for the past 21 months have cost 2½ cents per ton."

2. Road contractors in the deep South — "We now have more than 17,000 hours on our 105 and have not had to open the transmission for any reason."

3. "We averaged better than 45 feet a day on our job mostly because of the 105's." — This letter from a tunnel contractor who is driving a large heading with two 105's working side by side.

4. Quarry contractor — "In a few days we should receive our third Eimco 105. These machines are gradually taking over all production and are replacing the boom shovel."

5. Railroad contractor — "Our 105 has replaced a 1½ yard boom shovel and a bulldozer we had used to move stone up to the shovel.

THE EIMCO CORPORATION • SALT LAKE CITY, UTAH
EXPORT OFFICE, 51-52 SOUTH STREET, NEW YORK, N. Y.
BRANCHES AND DEALERS IN PRINCIPAL CITIES THROUGHOUT THE WORLD

EIMCO

B-346

During construction of vital Interstate Highway section, Campanella and Cardi's 22½-ton Mack dumpers once again proved that they are built to get the tough jobs done, with little or no down time and only routine servicing.

Vital highway links

LORAIN
RD-54
CAMPANELLA & CARDI

Maneuverability and ease of handling pay off in the tight spots. On the Division Street project in Pawtucket, R. I., space was at a premium. Spotting, dumping, or traveling over busy city streets, the combination of Mack maneuverability, and the positive traction provided by Mack's exclusive Balanced Bogie with Power Divider, materially speeded up work cycles on this project.

"We finished off the Interstate Highway job in record time, thanks to our Macks." Campanella and Cardi set new records for a job of this type, which included relocating the channel of the Big River, excavating for bridge construction, and hauling in heavy materials.

rushed to completion

"As the trucks go . . . so goes the job." That's what Campanella and Cardi Construction Co. of Providence report. They credit their 55 Mack trucks with maintaining their reputation for record-time contract completion.

They'll tell you that with Macks pacing the job, the hauling-dumping cycle proceeds on-the-double . . . shovels operate at full capacity . . . down time is held to a minimum.

Husky Mack dumpers take the day-in, day-out beatings delivered by the tons of rock and earth dropped from the shovels . . . and keep coming back for more.

Campanella and Cardi will tell you that Mack dependability speeds their entire operation. So will the Mack user nearest you. Get his name from your Mack branch or distributor. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

MACK
first name for
TRUCKS

Forging Ahead at Priest Rapids. This photograph shows construction work on the 1025-ft powerhouse at Priest Rapids Dam, a four-year building project that started in July, '56. Tremendous progress has already been made. Both the Public Utility District of Grant County, Wash., and the Northwest Power Pool can soon look forward to vast new supplies of electric power. Ten generators with a total rating of 788,500 kw will be installed in the powerhouse.

Enormous loads of materials are handled each day as construction proceeds. Cranes and other equipment require great quantities of wire rope, and Bethlehem is furnishing virtually all of it. The rope is supplied in the Purple Strand (improved plow) grade, which has the toughness and strength for any demands imposed upon it.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING

BETHLEHEM WIRE ROPE

BETHLEHEM STEEL

SPECIFY! H&L

Teeth that really dig!

HOE BUCKET

DRAGLINE BUCKET

DOZER CORNER ADAPTER

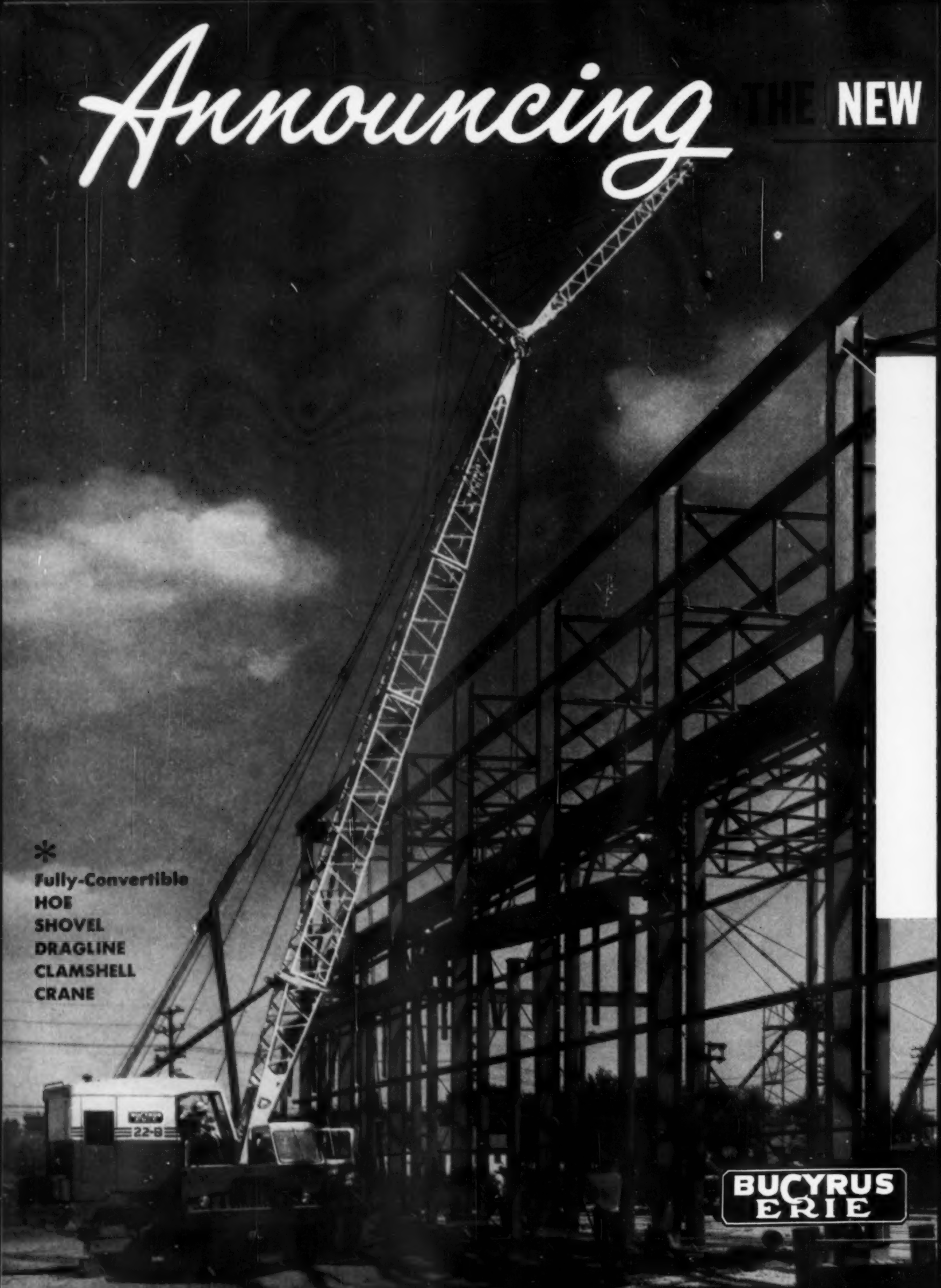
H & L Patent Nos. 2568075 - 2669153

WHEN ORDERING
NEW EQUIPMENT

MAKES GOOD EQUIPMENT
DIG BETTER–LAST LONGER

H&L TOOTH CO.

1540 SOUTH GREENWOOD AVE.
MONTEBELLO, CALIFORNIA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Fully-Convertible
HOE
SHOVEL
DRAGLINE
CLAMSHELL
CRANE
22-B
BUCYRUS ERIE

IMPROVED 12 WAYS... BUCYRUS-ERIE 22-B TRANSIT MACHINE*

Designed to give you the BEST Lifting Crane in its class with these profit-boosting features

1 **INCREASED LOAD CAPACITY AT GREATER RADIUS** — The 25-ton maximum allowable load can be lifted at a radius of 15 feet. With a 60-ft. boom at 40-ft. radius the new 22-B Transit Crane will lift 13,000 pounds, an increase of 60 percent in lifting capacity.

2 **STRONGER BOOM** — The crane boom is fabricated of Tri-Ten steel, approximately 50 percent stronger in yield strength than structural steel.

3 **LONGER BOOM** — Booms up to 110 feet are now available for crane operation. Maximum boom and jib combination is 100 feet plus 30-ft. jib.

4 **GREATER STABILITY** — Outriggers are extendible to 7½ feet from the center of the frame, for top stability on low boom work or heavy lifts.

PLUS THESE MAJOR IMPROVEMENTS

5 **SIMPLE BOOM INSERT CONNECTIONS** with a single bolt at each chord angle for the butt joint. Adapters for the pin joints are similarly attached.

6 **EASIER BOOM SUSPENSION** with pendants and 12-part tackle instead of 16-part tackle. A mast is required for boom 80-ft. and longer.

7 **READILY REMOVABLE COUNTERWEIGHT** — Counterweight is readily removable with a jib crane.

8 **CONVENIENT BOOM LOWERING FOR TRAVEL** — Booms up to 80 feet with or without mast can be lowered to cab height. Special equipment for folding long booms into carry position is available.

9 **EXTRA ROPE CAPACITY** — Drum flanges are increased in diameter to provide greater rope capacity.

10 **ADJUSTABLE CONE ROLLERS** (with shims) permit correct clearance between rollers and roller path. Rollers are also fitted with long life bushing to handle the greater roller loads.

11 **REMOTE CONTROL LUBRICATION FOR THE SWING GEAR AND PINION** by a gun mounted on the A-frame, is within easy reach from the operator's station.

12 **BIG, RUGGED, 6 x 4 CARRIER,** specially designed and built for fully-convertible crane-excavator service.

483E58C

and there's MORE!

These new features are but a small part of the story on how this new 22-B Transit Machine matches your needs, lifting or digging, to deliver low cost, top profit performance. For the many other advantages you can enjoy with this fully-convertible 25-ton crane and ¾-yd. excavator, visit your nearby Bucyrus-Erie distributor soon. Or send coupon for more information today.

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

a Familiar Sign at Scenes of Progress...

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

Gentlemen: I'd like more information on the new 22-B Transit Machine

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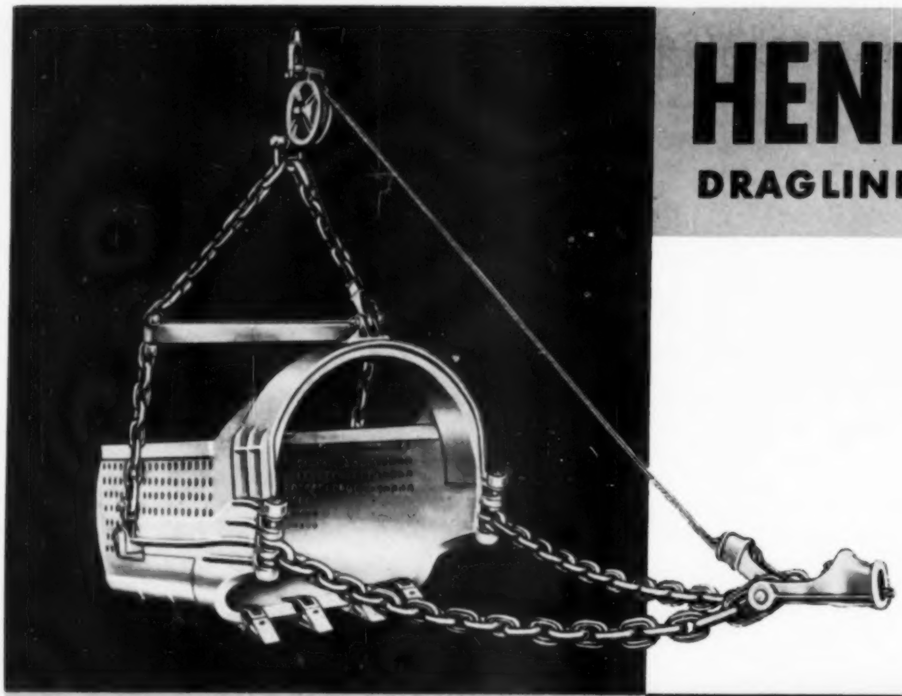
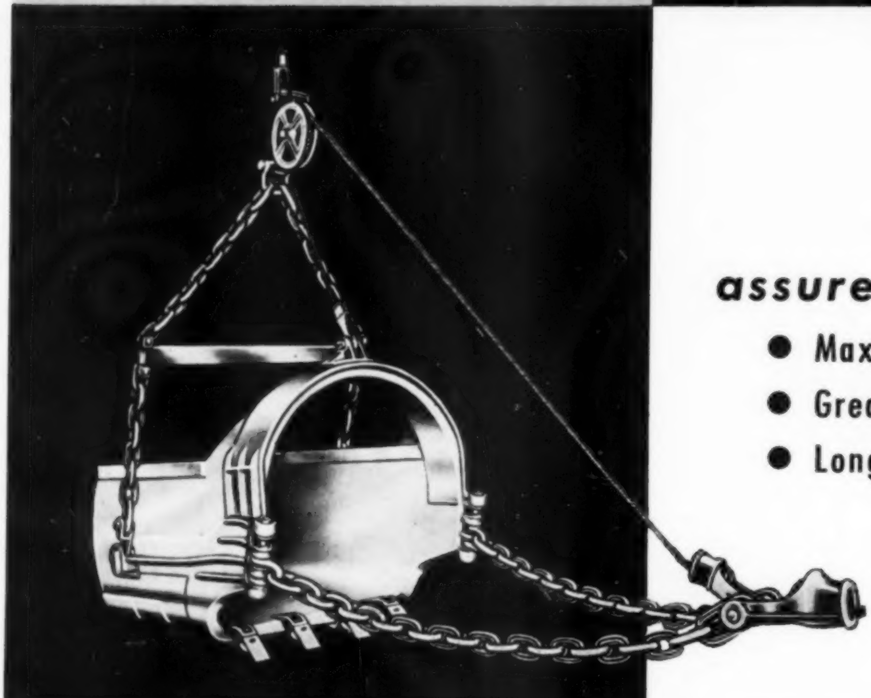
483E58C

HENDRIX

DRAGLINE BUCKETS



PERFORATED OR SOLID



assure...

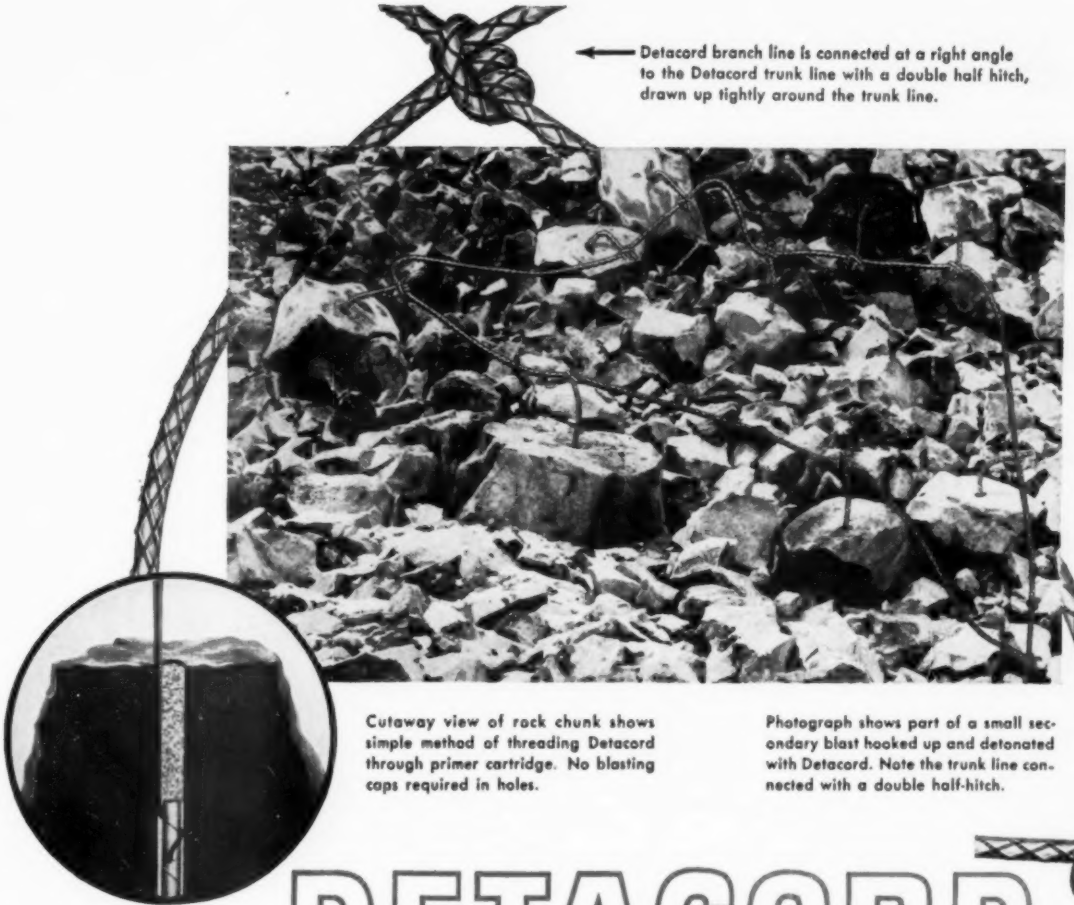
- Maximum Performance
- Greater Dependability
- Longer productive Life

Hendrix Lightweight Dragline Buckets

"A Type for Every Digging Purpose"
¼ to 40 Cubic Yards

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

Detacord branch line is connected at a right angle to the Detacord trunk line with a double half hitch, drawn up tightly around the trunk line.



Cutaway view of rock chunk shows simple method of threading Detacord through primer cartridge. No blasting caps required in holes.

Photograph shows part of a small secondary blast hooked up and detonated with Detacord. Note the trunk line connected with a double half-hitch.

DETACORD®

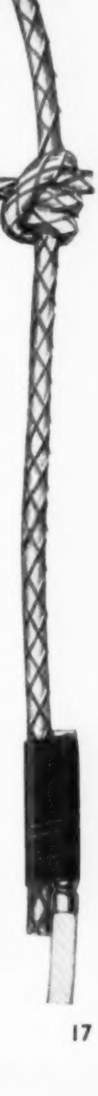
An effective, economical detonating fuse for Secondary Blasting, Long Hole Underground Blasting and Pipe Line Ditching

For this secondary blast, Detacord is used to prime the charge in each of the large chunks. A trunk line of Detacord connects with these branch lines and is, in turn, detonated with fuse and cap (or electric blasting cap). Result: an instantaneous blast which will "go" only when you give the word, with no danger of a premature caused by stray currents.

Detacord is a "little brother" to Primacord. It comes from the same family but it's smaller, less powerful. The core of PETN is not as large as in Primacord – and for this reason Detacord should *not* be used in primary blasting. But for secondary blasting, long hole underground and pipe line ditch blasting you'll find it effective – *and economical.*

Detacord has a waxed textile cover, light brown with cross windings of red yarn forming an X pattern. It is very flexible – is easily tied in square knots and half hitches as shown. Tensile strength 100 lbs. 500-ft. spool weighs 8 lbs.; 1000-ft. spool weighs 16 lbs.

See your explosives supplier or write for further information



The entire blast is detonated with fuse and cap (or electric blasting cap), the cap taped securely to the end of the Detacord trunk line, with the business end of the cap pointing in the direction of the explosive wave.

D-2

THE ENSIGN-BICKFORD COMPANY
Simsbury, Connecticut • Since 1836
Detacord® and Primacord® Detonating Fuse • Safety Fuse • Ignitacord®
Quarrycord® • Pyrotechnical Devices and Blasting Accessories

REPORT FROM OKLAHOMA:

CATERPILLAR EQUIPMENT SPEEDS INTERSTATE SYSTEM BYPASS

In clay and rock on the eastern edge of Oklahoma City, Noland Smith Construction Co. is carving out a 1½-mile bypass to U.S. 77, part of the National System of Interstate and Defense Highways.

At work is a 100 per cent Caterpillar team of earthmoving equipment that includes: eight Cat DW15 wheel-type Tractors with No. 428 LOWBOWL Scrapers, two DW21-No. 470 combinations, two D8 and one D7 track-type Tractors, and a No. 12 Motor Grader—14 big yellow machines in all.

The job involves moving some 600,000 cu. yd. of material. Six DW15-No. 428s moved 200,000 cu. yd. on a 2,400-ft. haul. And top daily production has been 7,400 cu. yd. A D8 with No. 8 Ripper breaks up rock where necessary. 400,000 cu. yd. on a 6,500-ft. haul were moved with eight DW15-No. 428s and two DW21-No. 470s. Top daily production has been 5,600 cu. yd. Average cycle time, 11½ minutes.

As the tempo of work increases on the 41,000-mile system of superfreeways, more and more contractors are standardizing on Caterpillar equipment. A recent survey of the $415 million Illinois Toll Highway showed that 53 per cent of the equipment at work was Caterpillar.

These contractors have found that for profitable production you can't beat the combination of good machines and good dealer service. You get *both* from Caterpillar. Ask your Caterpillar Dealer today for an on-*your*-job demonstration.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NEW BYPASS *will provide two 36-ft. main roadways and two 32-ft. service roads to U.S. 77, part of the Interstate Highway System, the greatest construction job in history.*

FAST CYCLE TIME *depends on swift, sure loading. Here a Cat D8 Tractor push-loads a DW15-No. 428 Tractor-Scraper combination. LOW-BOWL design assures a full load at every pass.*

BREAKING UP ROCK *is this D8, equipped with No. 8S Bulldozer and No. 8 Ripper. The high-speed haul roads used by the tractor-scrapers are maintained by a Cat No. 12 Motor Grader.*

"CATERPILLAR EQUIPMENT *gives us low-cost operation and low maintenance," says owner Noland Smith. "Add to this easy loading and speed in hauling and you have top production."*

Sauerman News Briefs

S

SPECIAL EDITION OF SAUERMAN NEWS

Brief items about the Sauerman Method . . . Crescent DragScrapers
Slackline and Tautline Cableways . . . Durolite Blocks

Sauerman Bros., Inc. • 622 South 28th Avenue • Bellwood, Illinois, (Chicago Suburb)

5-YARD DRAGSCRAPER SYSTEM HANDLES GRAVEL NEEDS FOR 82 MILES OF TURNPIKE

More aggregate production was needed by Southern Michigan Materials, Inc. to supply structural and, upon completion, the maintenance and incidental needs for 82 consecutive miles of the Ohio and Indiana Turnpikes.

This demand was met with a new plant and a 5-yd. DragScraper which supplies gravel at the rate of about 275 tph. Digging goes to a depth of 75 to 80 ft. Power is provided by a Sauerman three-drum hoist driven by a 325-hp. diesel. The rapid-shifting bridle provides a means of changing the DragScraper's line of operation by placing the tail block attached to the bridle in another position along the 250-ft. span between the two steel tail towers.

The hoist is pneumatically controlled by the operator from the hoist house. His location gives him excellent visibility of the entire pit and most of the plant.

The parent company, Northwest Materials, Inc., has completely excavated another pit nearby with a Sauerman 2-yd. Slackline Cableway. Northwest also uses a small scraper for stockpiling and reclaiming material from storage.

(Condensed from Sauerman News No. 145.)

DragScraper Uses Island for Parking Lot Fill

An island in the Kalamazoo River was used for parking lot fill by the Harrington Construction Co. of Fennville, Michigan. The job was handled by a Sauerman 3-yd. Crescent DragScraper and carrier assembly used with an Insley WB crane.

The hoisting line of the Insley served as track cable, running from the hoist drum through the middle sheave of the boom tip to a tree anchor on the island. The drag cable was attached to the front chains of the Crescent.

After digging and hauling to bank, the track cable was tensioned to lift the DragScraper and gravity return it to the excavation over 400 ft. away. Round trip took about a minute and a half. The 70-ft. crane boom was supported by two back stay cables leading from the boom tip to two tractors used as anchors.

(Condensed from Sauerman News No. 149.)

How MAPCO Digs and Hauls at a Cost of 4 Cents per Ton

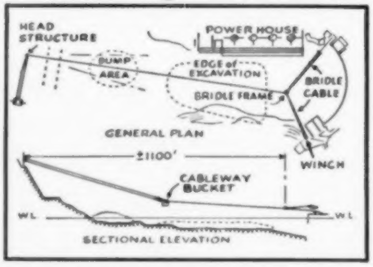
Mapco Sand and Gravel Co. is using a 2-yd. DragScraper to work their deposit at a cost of about 4 cents per ton. The company bases this figure on production of 235,000 tons and includes all labor, power, cable replacement and maintenance of hoist and blocks.

The DragScraper Machine is equipped with an electrically operated skid-mounted Sauerman hoist. Power is transmitted by V-belts. This new hoist replaced another Sauerman hoist that was in service for over 25 years.

The Crescent DragScraper works the pit and bank face and delivers to a ground level hopper on an average haul of 450 ft.

(Condensed from Sauerman News No. 148.)

De-Rocking a Tailrace



When the Washington Power Co. completed its Cabinet Gorge power plant and dam, an accumulation of rock at the discharge of the draft tubes had to be removed to insure unobstructed flow for the tailrace.

A Sauerman 2½-yd. Slackline Cableway, equipped with a rapid-shifting bridle system, was selected to do the job. Over 28,000 cu.yds. of rock varying in size from 6 in. to 5 ft. have been removed since the Slackline was installed. It is a permanent installation and is used periodically to clear the area in front of the draft tubes.

The Slackline operates on a 1000-ft. span. Material is excavated from 35 ft. of water and conveyed in the 2½-yd. bucket to a waste pile about 150 ft. below the tubular steel head mast. Power is supplied by a hoist located 190 ft. from the mast. The bucket and carrier assembly rides on a track cable, the lower end of which is attached to a rapid-shifting bridle frame controlled by a 10-hp. motorized spool-type winch. The rapid-shifting device permits the bucket's line of operation to be shifted laterally.

(Condensed from Sauerman News No. 143.)

MORE NEWS AND INFORMATION

Issues of Sauerman News giving greater detail about the installations on this page are available on request. For full information, tell us your interest or requirements and ask for catalog. Contact Sauerman Bros., Inc., 622 S. 28th Ave., Bellwood, Ill.

AFTER LOAD-FOR-LOAD COMPARISONS,

contractor trebles Payhauler® fleet!

Producing 380,000 cu. yd. of aggregate for their bypass paving contract (Rt. 277 around Abilene, Texas) Cage Brothers keep six units of their 9-Payhauler fleet busy at this quarry. With three units feeding crusher, and three stockpiling, the plant produces 7,000 cu. yd. of minus 2-in. aggregate daily.

Ton-for-ton and yard-for-yard, the road-building Cage Brothers, San Antonio, Texas, compared International Payhauler production with competitive off-highway rigs. Result: They trebled their "65" Payhauler fleet within a year!

Let Superintendent E. A. Rice give you the details:

"First we bought three Payhaulers and three competitive haulers. When we found it took two of them to equal one Payhauler, we got three more Internationals. Now (with more hauling) we have added another three, to give us nine Payhaulers.

"We've never had better equipment. Payhauler power, speed, and fast dumping cut cycle time. Operators go for Payhauler operating ease and riding comfort."

International Payhauler models give you fast getaway with a bonus of turbo-charged diesel power. They have a gear choice to match every load and road. And they provide the power-cushioning leverage of full-floating planetary drive axles, to minimize the slam-bang shock of off-road full-load hauling!

Try Payhauler "pick-up truck" spotting ease—assured by "zip-around" power steering and exclusive high reverse. Prove full-load ramp-climbing "muscle"—and up to 25% faster haul speeds. See how 7½-second dumping and Payhauler operating ease and safety figure sharply in out-hauling other makes, up to 2-to-1! See your International Construction Equipment Distributor for a demonstration.

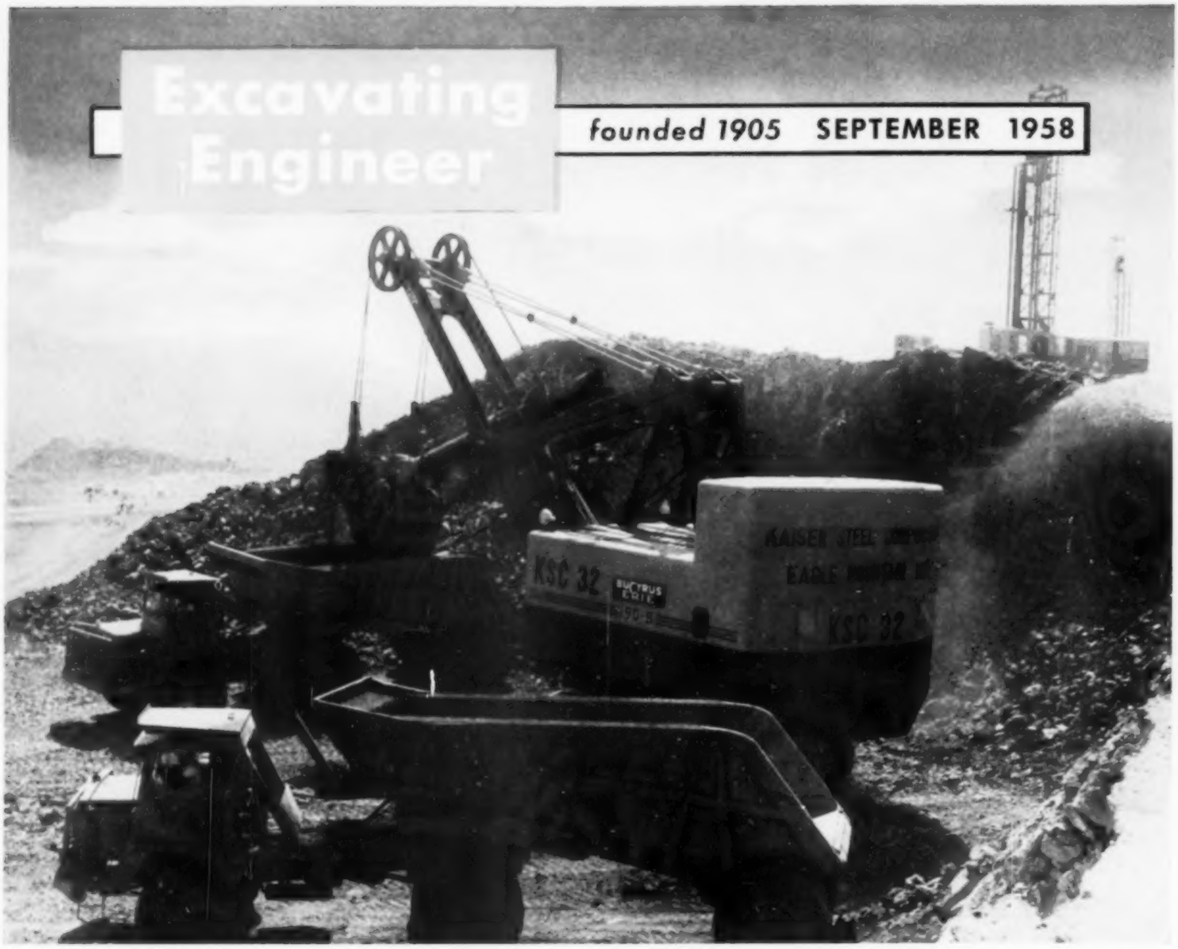
With extra-large air brakes, air-assisted clutch, and integral hydraulic steering, the "65" Payhauler gives fingertip operating ease—even when hauling 18-ton loads over rough terrain. This pair is stockpiling aggregate for Cage Brothers.

International® Construction Equipment

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

Excavating Engineer
founded 1905 **SEPTEMBER 1958**



This 8-yd. electric shovel is one of two such models in shovel lineup. Others are two 5-yd., one 4½-yd. and two 2½-yd. machines.

Eagle Mountain Expands Again

by Ray Day

EAGLE mountain has grown into a senior size mine.

Less than a decade after it began operating, Kaiser Steel Corporation's Eagle Mountain Mine is big business. Located in California only 200 miles east of Los Angeles, the mine has expanded from a small open-pit operation to a pit of impressive size. The new pit can supply 3¼ million tons of beneficiated iron ore to Kaiser's Fontana steel mill. The growing-up phase has seen mining excavation change from year to year, often quite radically.

For instance, drilling has covered everything from cable tool blast hole drill work through modern rotaries to the latest technique of all—an experiment in jet piercing. Shovel loading has run the range from early digging with 2½-yd. machines to a pair of big Bucyrus-Erie 190-B's, with 8-yd. dippers, now being used. Hauling units have matured to bigger sizes, too. In use to-

Kaiser Steel Corp. switches to 8-yd. electric shovels, 64-ton haul trucks and experimental jet piercing to supply 3¼ million tons of iron ore for its Fontana (Calif.) blast furnaces.

A Studebaker passenger car can drive under the giant Kenworth 64-ton model 803-B. Eagle Mountain Mine has ten of the haulers, powered by 400-hp Cummins V-12 diesels.

day are huge 64-ton Kenworth haulers, powered by 400-hp Cummins V-12 diesels.

What caused such expansion?

Well, for more than a century West Coast industry dreamed of a fully-integrated steelmaking facility . . . a home source for the steel products needed by the growing West. While there were several steelmakers on the West Coast, not until Kaiser began operations in 1942 was there a fully integrated plant which produced a finished product from essential raw materials of coal, limestone and iron ore. Steel was made in small quantities by remelting scrap, or by using pig iron, imported from sources outside the Pacific Coast area.

Today, Kaiser Steel operates four blast furnaces. These are the only blast furnaces on the Pacific Coast, and the hot metal they produce is refined into steel at the company's Fontana (Calif.) plant. The flow of ingots from the steelmaking furnaces is converted into a steady stream of finished and semi-finished products, such as plate, structural shapes, hot and cold rolled sheet, strip steel, carbon and alloy steel bars, electric welded and continuous welded pipe and tin plate.

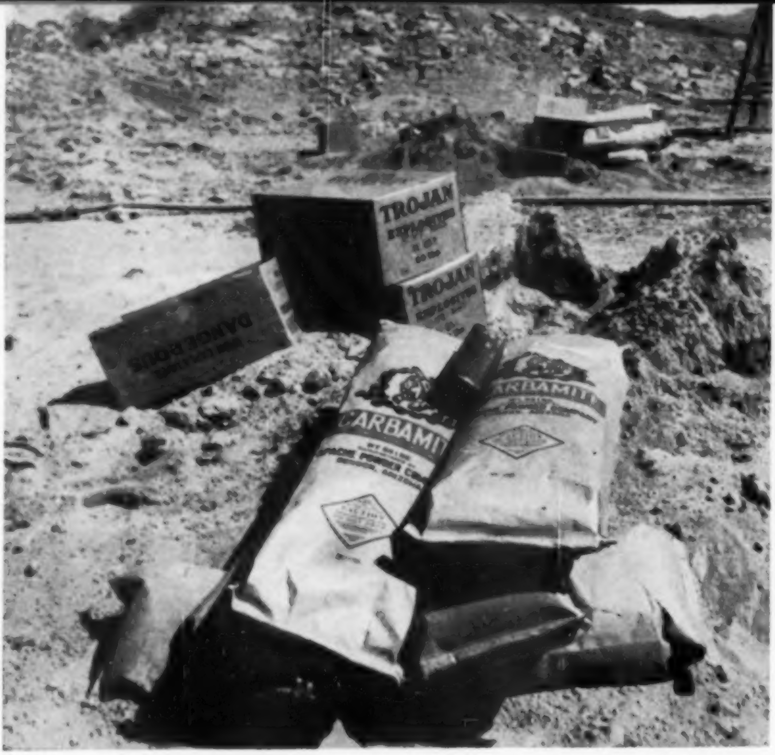
The Fontana plant has been so successful that its steady expansion was a certainty. And, despite the fact that Kaiser is currently affected by the same soft market to which other steel companies in the East are subject, it is nevertheless going ahead with major expansion plans for its Eagle Mountain property. The newer, bigger shovels and larger hauling units are already hard at work.

Develop Two Pits

To date, three ore bodies in two pits have been developed. One pit, the Bald Eagle, produced 4,600,000 tons of ore and is now mined to its planned depth. The other pit, the North-South, was started in 1952 and is presently being worked. Ore for capacity operation of four blast furnaces has been proved beyond doubt and the mining plan is under development. The average grade of ore in this pit is: iron, 47%; phosphorous, 0.086%; silica 12.18%; and sulphur 0.629%. An extensive exploration program is being pushed in other

Onan light plant for night loading stands like a sentinel during the bright daylight hours as shovel, trucks and drills work.

Using Hughes W7R bits, this 50-R electric rotary blast hole drills has maintained an average drilling speed of 40 feet an hour with an average bit life of about 400 feet.



Typical large-diameter hole loading materials behind a 50-R includes five bags of Carbamite, 150 pounds of Trojan bag powder and a stick of 60% gelatin. Powder factor during peak operations is 1.25 pounds of explosive per cubic yard blasted.

areas of the six-mile-long Eagle Mountain property to determine the full reserves and the exact location of ore of various grades, which may be needed in blending for future mill operations.

Current mining is in the north and south orebodies, which will be excavated in one pit. The orebodies dip approximately 45°. The hard, dense ore has withstood the erosion and consequently forms the backbone of the ridges, while adjacent softer waste material suffered more erosion. This was fortunate for Kaiser's planning, because it helps to make economical mining possible. Why? Because for many years the waste can be hauled on a level or downgrade. Benches 45 feet high are currently being used, and they will provide for the mining and stripping of orebodies at the apex at Elevation 1760, to the bottom of the pit at Elevation 700.

Truck haul roads are 70 feet wide, and are built on a 7½% grade.

The primary jaw crusher is presently located at Elevation 1500. Ore above this elevation has been worked out, and present excavation is moving ore from a bench at Elevation 1455. Sometime during the next 18 months the crusher will be moved to a lower elevation, where it will remain for the life of the pit. The ore above this elevation will be hauled down to the machine. The ore for three benches below crusher elevation will be transported up to the crusher. That which lies at deeper levels will be moved up to the crusher possibly by means of a future skip hoist.

The iron ore occurs in a series of over 60 orebodies, in a mineralized zone in metamorphic sedimentary rock. This zone varies from a quarter of a mile to 1¼ miles wide, and extends over six miles east-west across the northern Eagle Mountains. The iron ores occur as partial replacement of older zones, mainly within dolomites, and to a lesser extent, quartzites and quartz monzonites.

Principal ore minerals are hematite and magnetite. The former occurs mainly as a secondary mineral after pyrite and magnetite. Isolated small bodies of specular hematite which are of primary origin have been found, as have small bodies of limonite. The primary mineralization was apparently magnetite and pyrite. The latter was distributed widely throughout the ore, but the pyrite at most places within 100 to 150 feet of the surface has been oxidized. The unoxidized pyrite, along with gypsum, accounts for the sulphur content of the ore.

Hard Ores

The highest grade ores are either hard, dense, fine-grained hematite or hard, coarsely crystalline magnetite. A large percentage of lower grade ore is a hematite-magnetite mixture containing disseminated lime and magnesium silicates. The remaining low grade is magnetite in a gangue of serpentine and

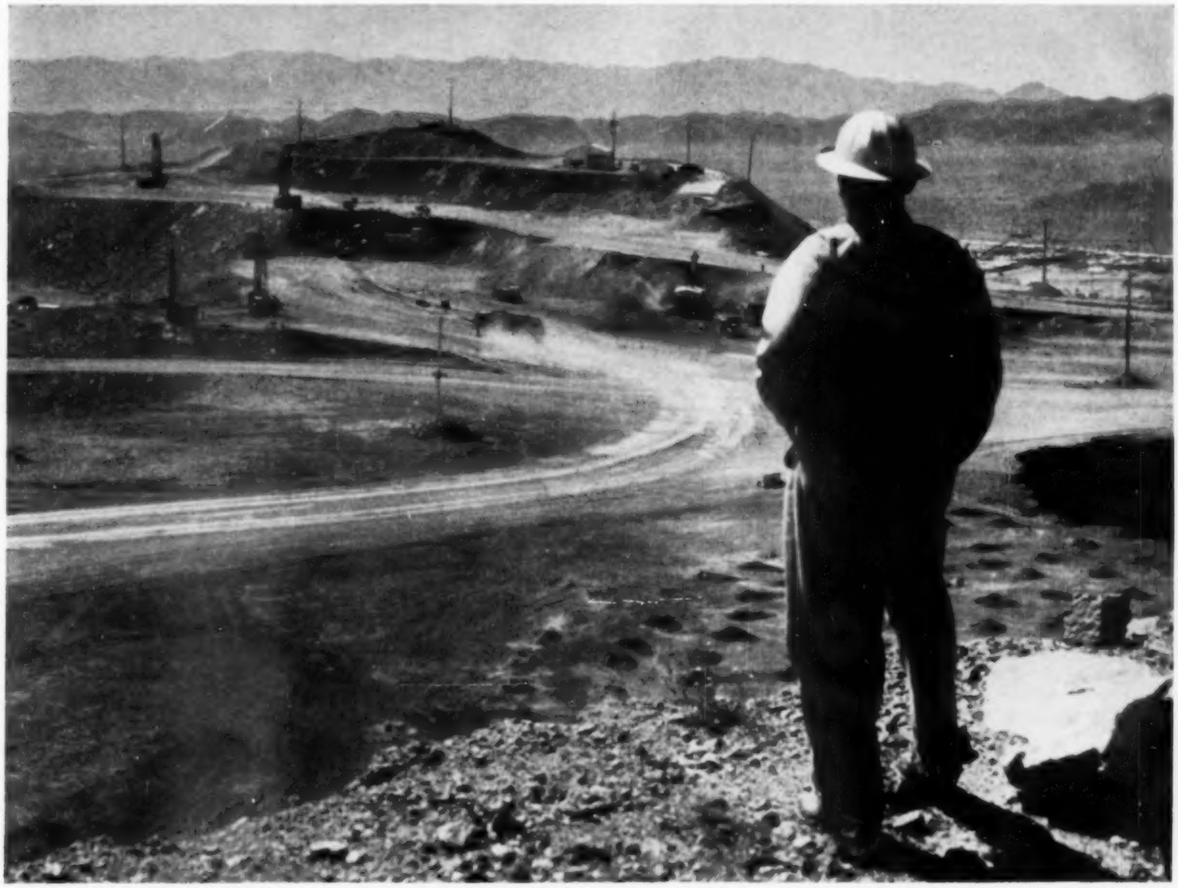
Discussing future pit development procedures are R. G. Heers (left), manager of mining and raw materials, and Martin J. Hughes, manager of Eagle Mountain.

schist. As a result of these factors, pit ore is extremely variable. There are ten other minerals or combinations of minerals which also have been found at Eagle Mountain. This, combined with the fact that dikes of waste have been intruded through the pit, makes for a variable orebody requiring the greatest care both in mining and beneficiation.

And, as if that were not enough, hard-to-soft areas are spotty in the extreme. Drillers know all too well the tendency for some of the very hardest places to outcrop in softer material. When this occurs between drill holes, high bottom and bad toe breakout are problems.

The drilling job has always been difficult, even from the start. In ore it ranged from a soft, easily drilled material to a very hard mixture of magnetite and hematite. The waste varies from an extremely hard quartzite to a hard quartz monzonite. Drilling practice is also complicated by the fact that the rock has been badly faulted and fractured. This combination of conditions has presented about as tough a drilling job as there is anywhere in the Pacific Coast states.

Earliest work, when mining began in 1948, was by Bucyrus-Erie 29-T blast hole drills. These machines were later replaced by heavier, larger and faster Bucyrus-Erie 42-T blast hole drills. At the time they were in use, Eagle Mountain's drilling practice was as good or better than most contemporary mining, using equipment then available. In fact, much valuable experience was gained when six of these machines did all the drilling for a total daily production of 18,000 tons of ore and waste. One of the important things these machines definitely proved, with their 5,100-lb. tool strings, was that 9-in. diameter holes were economical and effective.



Here is an overall view of the mountain-top excavation. The vast, lonely desert stretches away for miles in every direction.

Introduce Rotaries

Blast hole drilling with cable tools went by the wayside in November 1954, when a new Bucyrus-Erie 50-R rotary blast hole drill was purchased. Selection of this machine was made only after a lengthy, careful study based on hard rock drilling all over the nation. Engineers from the bit manufacturers were called in too, and the drilling studies they made were valuable.

Drill tests made on the rocks, showed that rotary drilling would work, with considerable cost savings. At that time, manufacturers estimated that the Eagle Mountain material could be drilled at rates varying from 10 to 37 feet per hour, and averaging 21 feet per hour. The average bit life was estimated at 460 feet.

The first 50-R performed so well that a second machine was bought in October 1956. The 50-R's have maintained an average drilling speed of 40 feet an hour with an average bit life of 400 feet, using Hughes W7R bits.

Performance of the 50-R's was excellent in the large amount of soft, medium and medium-hard material.

Kaiser enlarged its rotary drilling fleet still further with the purchase of an Ingersoll-Rand down-the-hole drill. Later, two additional Ingersoll-Rands

Ore from primary crusher at left of photo is conveyed to beneficiation plant. In background are settling ponds for tailings.

were bought. These drills also made a creditable showing, using 6⅞-in. diameter bits. In fact, the Carset bits on these machines averaged 16 feet of penetration per hour, and gave a bit life of 1,910 feet even in very hard drilling. Some experimental work also has been done with one of the drills, using a 9-in. diameter bit. Mine officials have concluded that the 9-in. bit is practical on that machine, and that since drill efficiency and penetration is equal to that of the 6 to 7-in. bits, it will give cheaper costs per yard.

In all large diameter blast hole work, 9⅞-in. drill holes are put down on 22-ft. average centers. Multiple rows are used because of the small size of the pit. All holes are drilled to a depth of 10 feet below bench elevation. Seven-inch holes are drilled on 15-ft. centers, and they too are drilled 10 feet below bench elevation.

Inject Water

Water is being used on the rotaries to dampen the rock cuttings. Injected at the bit point, the water not only dampens the dust, but helps to cool the bit. The drill cuttings cone beautifully around the drilled hole, making available a good supply of stemming around the powder charges. The 50-R's are equipped with Gardner-Denver compressors which furnish the necessary air blast. Rotation of the drill stems, of course, is through electric power and a stepped down gear train.

At the present time the holes are being loaded with a mixture consisting of 30% Trojan high explosive and 70% of an explosive made up of agricultural grade ammonium nitrate treated with diesel fuel. One gallon of diesel fuel is added to each 80-lb. bag of ammonium nitrate before it is placed in the hole. The high explosive is used to detonate the fertilizer and add speed. Primacord millisecond delays have been used to eliminate concussion and improve breakage. The powder factor, based on peak operations during the last six months of 1957, was 1.25 pounds of explosive per cubic yard of material blasted.

This drilling-blasting practice has given good results, improving the efficiency of shovels and truck hauling at the same time. There has been some trouble with toe breakage, but this is currently being handled by using slightly faster powder at the bottom of each hole. What little secondary blasting has been done has been handled by a Travel Drill, which eliminates hauling hose and jackhammers around the pit. Holes put down by the mobile Travel Drill are loaded with gelatin type powder and detonated by electric caps.

Currently undergoing intensive test-

Newest drill rig is this jet piercer, converted from an old Bucyrus-Erie 42-T cable drill. Experimental rig has shortened derrick and a much shorter spudding stroke.

Workhorse Shovel

Here's a performance story that establishes the Bucyrus-Erie 120-B electric shovel as an all-time workhorse.

After eight years of continuous service, during which time it handled 9¼ million tons of material, Eagle Mountain's venerable 120-B was recently overhauled. C. A. Scott, master mechanic, can take it from there.

"The good shape it was still in was unbelievable," Scotty explained. "Not a single major gear needed replacement. We dipped and turned the commutators and went over the electrical system. The tracks needed new pins, but after all that use the old track pads were still in good condition. We replaced the intermediate hoist shaft, but only because of a small crack which showed up.

"We did a lot of work on the boom, because of the rough use it gets, including reinforcement and welded side plates. New boom pennants were installed. There were minor parts which needed replacing, but everywhere we looked we were amazed to see the way those parts had stood up under all that punishment."

Using the 120-B repair job as fill-in, Scotty's men soon had the shovel back in new condition. Sporting the modern Bucyrus-Erie cream and maroon paint combination which hadn't been adopted when the 120-B first started working, the dependable old workhorse is back in the pit, working on its second 10 million-yd. assignment.

ing is a jet piercing rig which was developed by the Linde Co., and Kaiser's Eagle Mountain shop. One of the old Bucyrus-Erie 42-T's was converted to make the new machine. It was overhauled, beefed up, its mast shortened and the spudding beam stroke shortened to 4 inches. The spudding beam keeps the flame moving up and down near the bottom of the hole.

The rig uses about 10,000 cubic feet of oxygen per hour, 1,000 gallons of water, and about 40 to 100 gallons of fuel. The burner puts out 6,000° F heat in a supersonic blast moving at a velocity of 6,500 feet per second. This enormous blast of heat expands and heats the rock; the water jet cools and cracks it. The water jet also creates steam which helps other blast gases to force cuttings up to the surface. In certain types of formations, the new machine has developed excellent penetration, particularly in homogenous formations. But it has had more than its share of setbacks in fissured, fractured formations. They seem to be the rule rather than the exception at Eagle Mountain.

Results Inconclusive

When *Excavating Engineer* visited the mine, the new machine had been in use only three weeks. According to Mine Manager Martin Hughes, results are still too inconclusive to say whether or not this method will lower drilling costs in very hard material. He hopes, of course, that the experimental rig will work as well as it has in Minnesota's taconite country. If it does, the jet piercing rig will have still another advantage: it can probably be used to enlarge the bottom of holes to give a springing effect. That will help to cure the toe breakage problem along the benches.

Newest machines in the loading lineup are a pair of Bucyrus-Erie 190-B's, with 8-yd. dippers. Purchased especially because the stripping ratio jumped from 1:1 to 4:1 as the mine was expanded, these big machines are filling the job of loading waste overburden. The Eagle Mountain setup also has two Bucyrus-Erie 150-B's, with 5½-yd. dippers. While the 150-B is rated at 6 yards, these machines load ore part of the time and —because the ore has such high specific gravity—a smaller dipper puts less punishment on the shovels.

A Bucyrus-Erie 120-B with a 4½-yd. dipper has recently been reconditioned (see box this page) and is back on the line loading both ore and waste. Two older 54-B's with 2½-yd. dippers also are at the mine. They are used principally for opening restricted areas and bench development.

Hauling units under these shovels include 22-ton Euclid end dump trucks. Of 11 such units, part saw original service when the mine was opened. Newest haulers are six Kenworth 803-A 40-ton trucks and ten 803-B 64-ton Kenworths. The latter are powered by 400-hp Cummins V-12 diesel engines. Double spotting is used wherever possible under the shovels, so the machines can load to the best advantage with the shortest swing.

The pit floor around the shovels is maintained by dozers, so that stray rocks can be kept out of the way of tires. The 70-ft. haul roads also are patrolled by Cat motor graders for the same reason. Everything possible is done to emphasize the need for full loads on this big equipment, hauled carefully.

A large portion of waste overburden

Continued on page 64

Back on the line after overhaul is this 4½-yd. 120-B electric—a veteran of eight years and 10 million yards of digging. Kenworth truck is loaded in three passes.

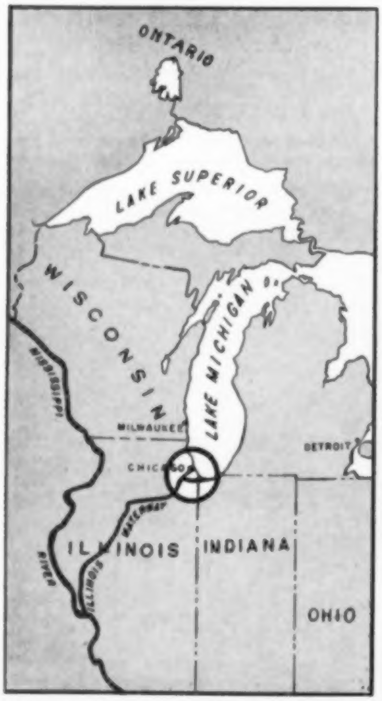
BUCYRUS ERIE

Channel Project To Meet Chicago Industry Need

Waterway originally designed as a sanitary facility is being turned into two-way barge traffic route for Calumet industrial area. Big draglines do major part of excavation work.

MORE than a million cubic yards of rock and earth per mile are being blasted and dug to widen the Calumet-Sag Channel in Illinois' southern Cook County. When the 16.2-mile long job is completed, industries in the Calumet area south and east of Chicago will have a much needed two-way barge traffic route capable of handling shipments of raw materials and manufactured goods to and from what has been called the world's most highly concentrated industrial region.

In addition to serving Calumet area industries, the Calumet-Sag Channel is an important link in the Illinois Waterway—a network of rivers and channels that joins the Great Lakes to the Gulf of Mexico by way of the Mississippi River. Waterborne traffic moving between the Great Lakes and Mississippi River must funnel through the waterway.



Shown is the relation of the Illinois Waterway to the Great Lakes-St. Lawrence and Mississippi-Gulf systems. Circled is the Calumet-Sag Navigation project.

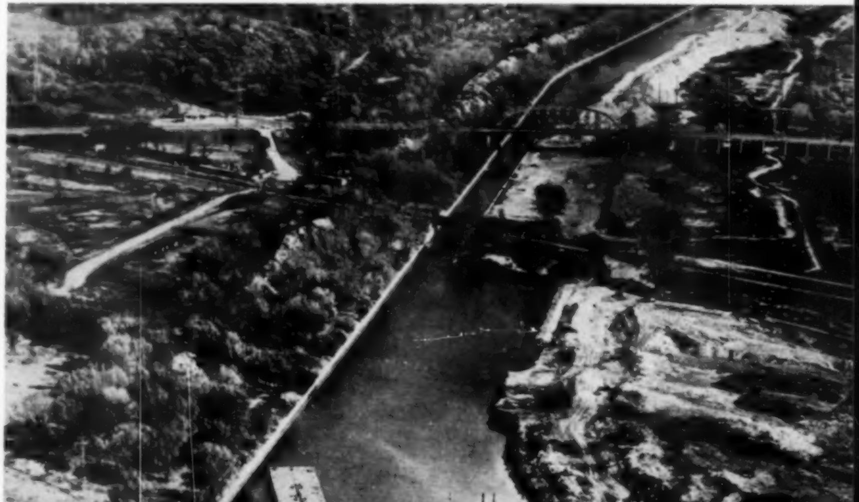
Most of the Illinois Waterway can accommodate modern barge traffic tows, but it lacks an adequate extension into the Chicago region. Here two routes are available for barge traffic coming to or moving from Lake Michigan with their cargos. One route is the Chicago Sanitary and Ship Canal; the other is the Calumet-Sag Channel.

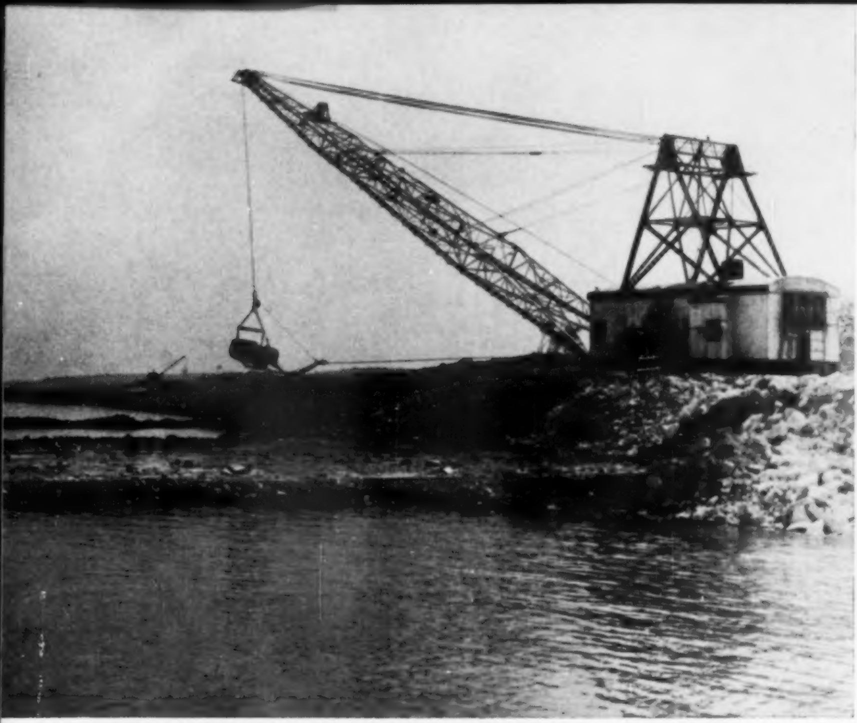
Limited Use

The Chicago Sanitary and Ship Canal provides access to the Chicago Harbor on Lake Michigan and serves downtown Chicago, the center of wholesale and retail business activities. While it has always handled an important volume of traffic, the canal's 160-ft. width and many fixed bridges with restricted vertical clearances keep it from becoming a major route for commercial shipping and an effective link in the chain connecting the Great Lakes with the Mississippi River. Improvements to make the canal a major commercial shipping route and the principal connective link are next to impossible because of the tremendous costs which would be involved.

There are additional factors which make improvements to it impractical. More bridge openings would be necessary, causing a serious interruption to highway and railroad traffic. Heavy industry would be neglected since manufacturers are shifting from the center to the southeast of the city. Nor does the Chicago Sanitary and Ship Canal offer a suitable harbor or terminal site for barge-ship-rail-truck interchange.

An aerial view of Cal-Sag at its junction with the Chicago Sanitary and Ship Canal shows the old and new channel widths. Work proceeded eastward from here.





A Bucyrus-Erie 450-W walking dragline swings for another bite of earth as it widens the channel to 225 feet from an original 60-ft. width which restricted navigation.

The Calumet-Sag route, therefore, is the only practical means of getting a major commercial shipping lane in the Chicago area and the only means of effectively connecting the Great Lakes and the Mississippi River.

The Calumet-Sag route uses the Calumet-Sag Channel and Little Calumet River. These waterways by-pass the Chicago business district and lead directly through comparatively open country to the Calumet region where numerous steel mills, oil refineries and storage facilities, grain elevators and chemical industries are located.

In 1935, as traffic on the Illinois Waterway began to develop in considerable volume, the federal government authorized improvement to the Calumet-Sag route so it could be used to a limited extent by barge traffic. The improvement consisted of dredging three passing places on the Calumet-Sag Channel; widening the Little Calumet and Calumet Rivers to 300 feet, with 9-ft. navigational depth, as far as Lake Calumet; and the construction of an entrance channel and limited terminal basin at the south end of Lake Calumet to accommodate deep-draft navigation as well as barge traffic.

Despite narrow channel width (the Calumet-Sag Channel is only 60 feet wide) and bridge clearance difficulties encountered by river craft navigating the Calumet Sag route, traffic on it has steadily increased until today a maximum in shipping tonnage is being carried on the route.

To better serve Calumet area industries and provide an adequate interchange between barge traffic of the Illinois Waterway and deep-draft lake and ocean vessels entering Calumet and Indiana harbors, the federal government in 1946 passed an act authorizing the Calumet-Sag Navigation Project.

Project Phases

Main features of this $200 million, largely federal-financed, project include:

1) Widening the entire length of the Calumet-Sag Channel from 60 to 225 feet from its junction with the Chicago Sanitary and Ship Canal at Sag Junction to the Little Calumet River at Acme Bend, a distance of 16.2 miles.

2) Replacing, altering or removing nine railroad and 14 highway bridges crossing the channel in conformance with the horizontal and vertical clearance requirements of the improved channel.

3) Removing the Blue Island controlling works, 50 feet by 250 feet, which is to be replaced by a 110 x 1,000-ft. lock in the Calumet River south of Turning Basin No. 5.

4) Widening the channel at Acme Bend in a section from Blue Island to Turning Basin No. 5, a distance of 7.3 miles.

5) Widening the Grand Calumet River from 100 to 225 feet, with a navigable depth of 9 feet, from its confluence with the Little Calumet River to its junction with the Indiana Harbor Canal.

6) Altering, replacing or removing 12 railroad and 10 highway bridges spanning the river.

7) Constructing an adequate barge-rail-truck terminal near Clark Street, Gary, Ind.

8) Constructing a lock and controlling works in the Grand Calumet River west of its junction with the Indiana Harbor Canal.

9) Widening from 160 to 225 feet the 10.4-mile stretch of the Chicago Sanitary and Ship Canal from Lockport to Sag Junction.

10) Converting five highway bridges over the Sanitary Canal from fixed to lift spans.

11) Replacing an emergency dam above Lockport.

The Calumet-Sag Channel portion of the Calumet-Sag Navigation Project is scheduled for completion in 1962.

The Calumet-Sag Channel is an arti-

Where earth cannot be wasted into spoil piles along the channel right-of-way, hauls to off-site dump areas are necessary. Material in the dry is often moved by scrapers.

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3

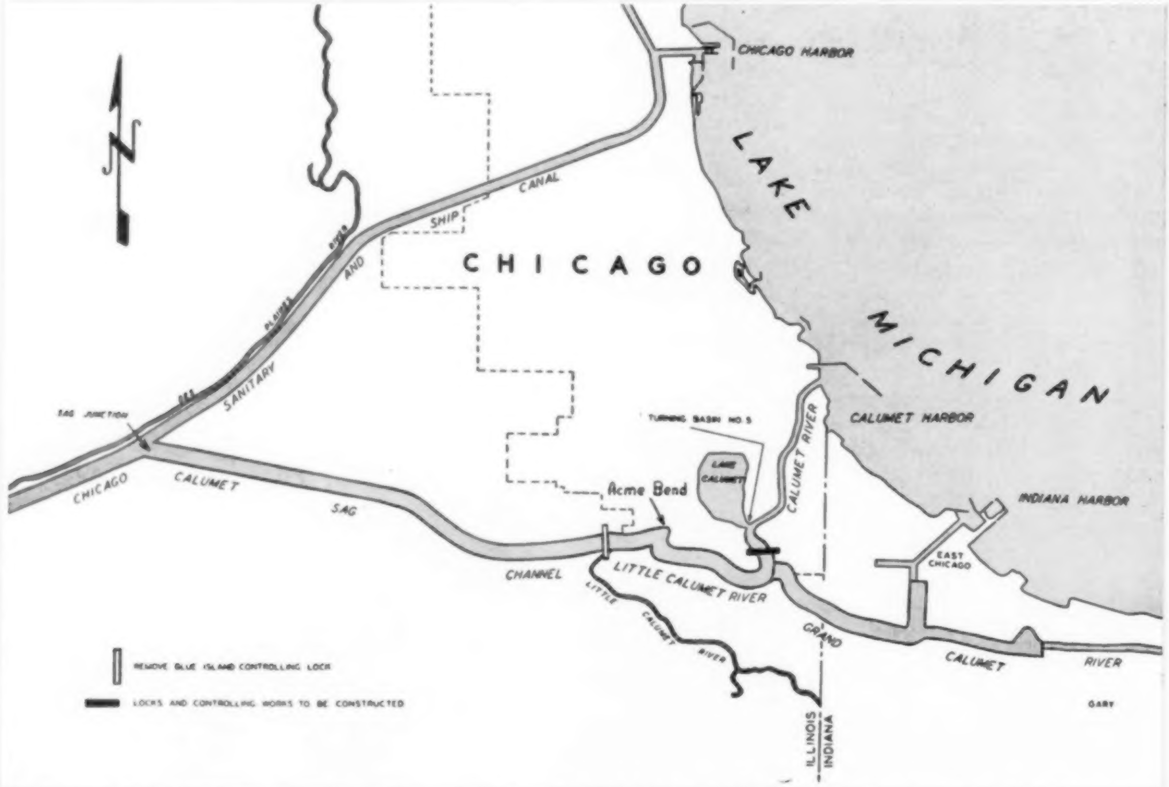
A-frame of the 450-W is lowered into position. Known as the *Gentleman*, the machine was towed from the St. Lawrence Seaway to the Cal-Sag job on a 50 x 175-ft. barge.

Specially designed 15-yd. Page rock-digging bucket dumps muck onto spoil pile. View is from inside 450-W operator's cab.

ficial waterway that was constructed by the Metropolitan Sanitary District of Greater Chicago for disposal of sewage from the Calumet area. It was completed in 1922 with a depth of 20 feet and bottom width varying from 36 to 60 feet. As a sanitary facility, the channel has adequately served its purpose. As a means of barge navigation to which it has gradually been adapted by industry, the Cal Sag's dimensions and bridge clearances have exerted a stranglehold on its usefulness.

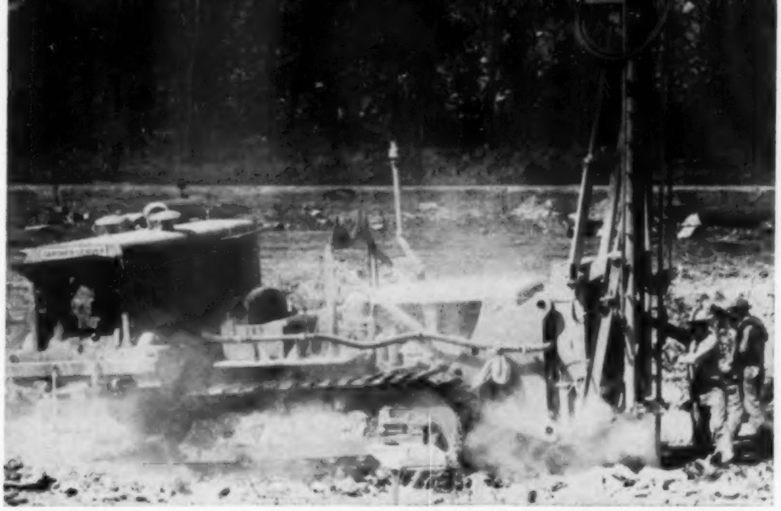
Work on the Cal-Sag Channel is under the supervision of the Chicago district of the U. S. Army Corps of Engineers. It is anticipated that the widened channel will be able to handle all forseeable barge navigation with ease—navigation which in 1956 amounted in shipping tonnage to 5.5 million tons. Shipping is expected to reach an annual mark of 12 million tons five years after completion of the project and 18 million tons in 25 years.

Contracts covering the first 10 miles of the Cal-Sag Channel widening have


CHICAGO HARBOR
LAKE MICHIGAN
CHICAGO
SHIP CANAL
AND
DES PLAINES RIVER
SANITARY
SAG JUNCTION
CHICAGO
CALUMET
SAG
CHANNEL
TURNING BASIN NO. 5
LAKE CALUMET
CALUMET RIVER
CALUMET HARBOR
Acme Bend
INDIANA HARBOR
EAST CHICAGO
LITTLE CALUMET RIVER
LITTLE CALUMET RIVER
GRAND CALUMET RIVER
GARY
ILLINOIS
INDIANA
REMOVE BLUE ISLAND CONTROLLING LOCK
LOCKS AND CONTROLLING WORKS TO BE CONSTRUCTED

Map shows Cal-Sag's relation to other waterways. It is considered key to the system of barge navigation in the Chicago area.

A cross-section of material being dug by the 450-W shows a top layer of clay



A Cat D7 tractor, with a Joy T-500 air drill rigged on its front and a Gardner-Denver air compresser mounted crosswise on its rear, provides a mobile land drilling unit.

C. W. Badger is job superintendent for Badgett Mine and Stripping Corp., a subcontractor on the Cal-Sag's contract section 2 and a joint-venturer on section 3.

been let, with work proceeding from Sag Junction near highway 83 eastward to Blue Island. Bids were let by sections. The first 3-mile section was undertaken by Mary Construction Co., Cape Girardeau, Mo. It is completed. An adjoining 3-mile section was successfully bid by S. J. Groves & Sons, Inc., Minneapolis, Minn. It will be finished by the first of next year, three months ahead of schedule.

The next section is a 4-mile segment being undertaken jointly by Mary Construction Co. and the Badgett Mine and Stripping Corp., Madisonville, Ky. It is about 50% complete. Another three miles will be let this fall, and the remainder of the widening project will be let after completion of railroad and highway bridge alterations in the Blue Island area.

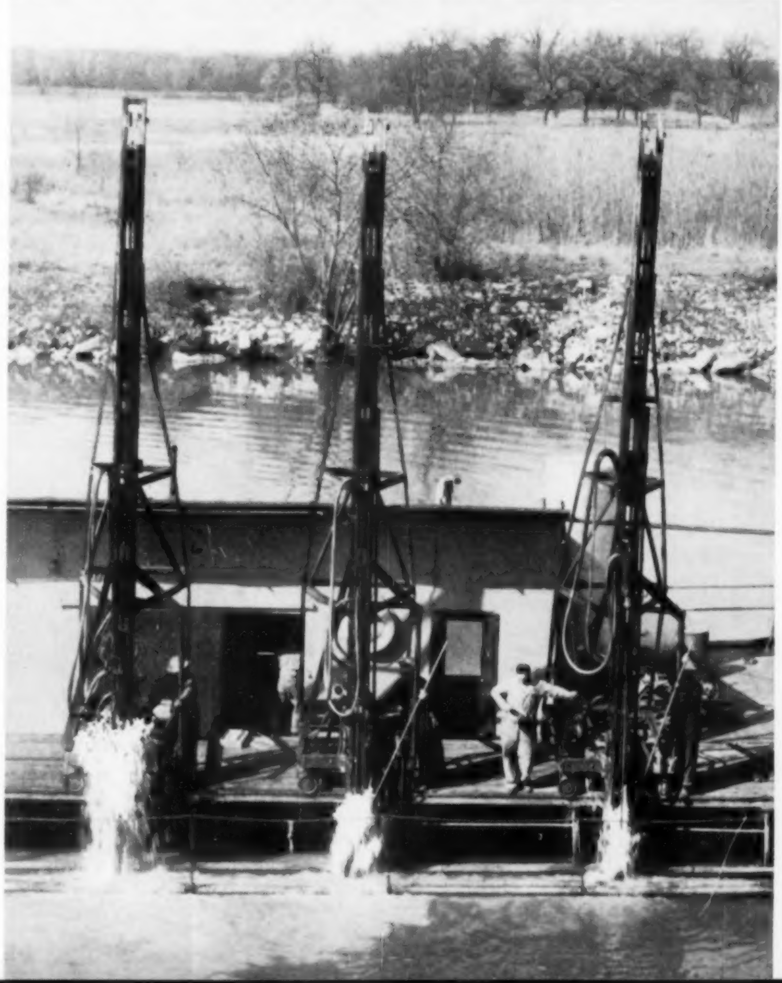
Contract Quantities

S. J. Groves' section 2 contract is located east and west of the intersection of U. S. routes 45 and 83 in Palos Park, Ill. Worth $2.4 million, it requires the excavation of 380,000 yards of rock, 2,300,000 yards of unclassified material and the construction of drainage structures. These drainage structures will be corrugated steel or concrete pipes of up to 60-in. diameter that will be placed through spoil piles at certain points to carry storm sewer and highway drainage into the channel. They will be installed after channel widening is completed.

Material being blasted and dug to widen the section 2 contract of the widening project, as well as on other sections, is wasted into spoil piles along the channel right-of-way, except in areas where buildings, highways or railroads are so close to the channel that hauling material to off-site locations is necessary. Where off-site hauling could be done in the dry, Groves has used a fleet of Euclid and Tournapull scrapers and Mack end-dump trucks. The major part of the excavation on the section 2 contract, however, requires the use of draglines. For this task Groves has subcontracted work to Badgett Mine and Stripping Corp., the firm in joint-venture with Mary Construction Co. on the section 3 contract.

Badgett crews and equipment started their work on section 2 in June 1957. Backbone of the Badgett operation is a 9-year-old Bucyrus-Erie 450-W walking dragline with a 183-ft. boom that

Underwater drilling is handled from the 26 x 100-ft. barge Wasp, which carries three Gardner-Denver model DH 123 drills mounted along one side for easy spotting.



Blast sends water and rock shooting skyward. Proximity of dwellings and other structures along channel right-of-way limited most shots to 2,500 pounds of powder.

swings either an Esco or 15-yd. Page perforated bucket, depending on the type material being dug. The Page bucket was especially designed and built for Badgett by Page Engineering Co., Chicago, to dig shot rock under water. It is extra long and rather shallow. This added length keeps the bucket's lip end from jumping up when pulling force is exerted by the drag cable.

The big dragline, named the *Gentleman,* is the same machine used by Badgett on the St. Lawrence Seaway to excavate a portion of the Long Sault Canal, where it at one time worked in weather as cold as 50° below zero. This was made possible by keeping its 850-hp Cooper-Bessemer diesel engine running constantly.

Shipped by barge from the Kentucky coal fields to the Seaway project in 1955, the 450-W was towed from the Seaway through Great Lakes' connecting channels to the Cal-Sag job on a 50 x 175-ft. barge in late spring of 1957 at a cost of over $100,000. It was unloaded at the job site with the aid of three Cat tractors which cut a slip into a low bank on the channel then pulled the barge to shore. The Cats next built a dirt ramp to deck level of the barge, and the dragline backed off under its own power.

The *Gentleman* dug 237,000 yards of material during its first 17 days on the Cal-Sag job. It averages 3,000 to 4,000 yards per eight-hour shift and works 24 hours a day, six days a week. It is operated by experienced men who have been with Badgett for a number of years and know their job well. The operators are Bill Waterman, Don Utley and Ike Kemble.

A cross-section of material being dug by the 450-W shows a top layer of clay, under which lie alluvial deposits. This is followed by intermittent large pockets of peat. Then comes an average 4-ft. thick layer of glacial till, the contents of which range in size from sand to large boulders. Below this is limestone rock.

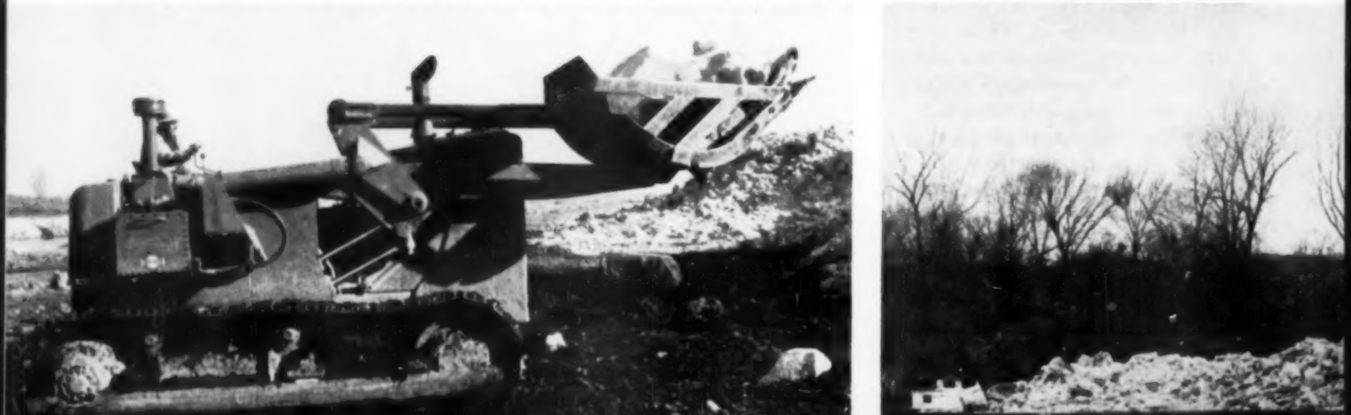
Excavation Procedure

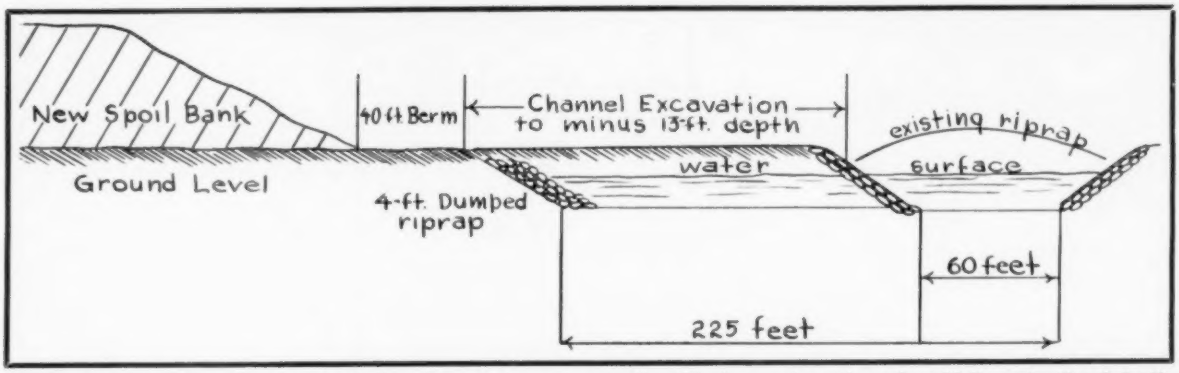
Channel excavation takes place in the following manner. Trees, shrubs and man-made objects are first cleared from the right-of-way. Scrapers and end-dump trucks are brought in to haul earth to off-site areas, where this is required. Draglines then widen an initial 60-ft. strip, measuring from the toe of the channel landward, down to between 4 and 5 feet above water level.

Tractor-mounted drills then move in and bore through the layer of glacial till to prepare blast holes in underlying limestone rock. After blasting with a highly water-resistant type explosive, draglines excavate the initial 60-ft. strip down to a required minus 13-ft. navigational depth and widen the channel to its full 225-ft. width, again leaving a 4 to 5-ft. thick layer of glacial till covering the limestone rock in the remaining 65 feet. Drills are brought in for the second time. Drilling is followed by blasting. Draglines make a third pass at the channel, completing excavation.

Shoals of rock are sometimes encountered by the draglines in excavating to the required minus 13-ft. depth. These shoals are fragmentary jettings of rock not leveled by the land drilling and blasting methods and must be removed so a uniform navigational depth is assured along the length and width of the

A 4-ft. thick blanket of riprap is placed along the excavated channel bank by an Allis-Chalmers HD-21 Hi-Lift loader equipped with a special fork lift (left) and by a Bucyrus-Erie 71-B crane, shown here working from a barge with a clamshell bucket (right).





Here is the plan and profile for a typical section of channel excavation. Digging must reach a minus 13-ft. navigational depth.

entire channel. For this removal work, drilling and blasting is done from a drill barge. Draglines must make a fourth pass at the channel in areas where overwater drilling is necessary. Final steps in the excavating procedure involve dressing the slopes of spoil piles and placing a 4-ft. thick rock blanket on the channel bank to prevent earth from sliding back into the channel.

For land drilling on the section 2 contract, Badgett crews fashioned an Ingersoll-Rand air drill with rotary type bit on the front of an Allis-Chalmers HD-20. Power for the drill is supplied by an Ingersoll-Rand 600 Gyro-Flo compressor mounted crosswise on the rear of the tractor. This arrangement provides a highly mobile drill unit which can be moved from one drill site to another with ease and in a minimum of time.

The Ingersoll-Rand drill uses a 6¼-in. bit and averages about 176 feet per eight-hour shift. Holes are drilled to an average minus 22-ft. level on 12 to 14-ft. spacing centers. It is usually necessary to bore through glacial till covering the limestone, so holes are always cased to prevent small stones and other material from falling in and plugging them up.

Because drilled holes fill rapidly with ground water, a water resistant semi-gel explosive is used. The explosive comes in 5 and 5½-in. sticks, 50 pounds to a carton. Brands being used include American Cyanamid, Hercules and du Pont. Detonation is effected by Primacord safety fuse strung to the bottom of each hole. The Primacord is set off with blasting caps. Due to the proximity of dwellings and other structures along most of the channel right-of-way, average shots are limited to the use of 2,500 pounds of explosives. Seismographs are employed to determine the size of the blasts in order to keep them within a safe zone. In comparatively open country, some 10,000 pounds and more of explosives have been detonated in a single shot. These blasts break up about 20,000 yards of rock.

Overwater drilling on the section 2 contract is handled by crews and equipment of the Mary-Badgett joint-venture working on the section 3 contract. Drilling equipment consists of the 26 x 100-ft. barge *Wasp*, which carries three Gardner-Denver model DH123 drills track-mounted on rolling carriages along one side of the barge for easy spotting.

The barge is tended by a small tug boat, which moves it into drilling position and out of blast range prior to detonation of a shot. After being towed to its drilling position, the barge is anchored by two steel spuds and secured to shore by lines fastened to the channel banks.

Enclosed on the deck of the barge are two Sullivan 700-cfm air compressors that provide power for operating the drills. Each compressor is driven by a Murphy diesel engine.

The three Gardner-Denvers have 26-ft. masts which make it possible to drill full depth without changing steels. A 3½-in. hole is bored with Vascaloy carbide insert bits to an average of 12 feet, including 4 feet of subgrade drilling.

Mud Pot Drilling

Underwater drilling is kept in the dry by using what is called the mud pot method. A hollow steel pipe long enough to stick out above water level and larger than the diameter of the drill bore is driven into mud overlying the rock. The drill stem is sent down through this pipe and works within it. A compressed air line is run into the pipe and blows water and rock cuttings up through the pipe to water surface. Working by the mud pot method, the Gardner-Denvers drill some 5,000 feet per eight-hour shift, except when working on the edge of a previous shot where the rock is partially fractured. Drilling footage drops in these places because of the difficulty of forcing compressed air into holes to blow out cuttings, and because the drill steel often gets wedged between fissures created by a previous blast.

When the required drilling depth has been reached, the drill is retracted and

The Cal-Sag project is being directed by Col. John B. W. Cory, Jr., Chicago District, U. S. Army Corps of Engineers.

Enclosed on the deck of the barge *Wasp* are two Sullivan 700-cfm air compressors that provide air for operation of the drills.

the compressed air line removed. The hole is then loaded with the same type explosive used in land drilling shots. Primacord is attached to the explosive and run up to the barge deck where connection is made to a battery which sets off the detonating fuse. Finally, the pipe casing is removed and the hole is ready for blasting. For an average shot, about 40 holes are drilled, into which are packed nearly a half-ton of explosives.

Material cut away from the channel banks in the widening process and rock and muck dredged from the channel bottom are wasted into spoil piles along the channel right-of-way, area permitting. These spoil piles are leveled by bulldozers to a required 5 to 1 slope on the channel side and 10 to 1 slope on the land side, then covered with a 1-ft. thick layer of dirt to provide a footing for revegetation.

Specifications call for placing a 4-ft. thick rock blanket reaching 4 feet above datum along the excavated channel so earth along the banks does not fall back into the channel after being exposed to weather elements for a time. A minimum 75 and maximum 4,000-lb. size limit must be observed in selecting rock for the blanket, but allowable fines can run as high as 10%.

Riprap for the blanket is dumped on the bank by an Allis-Chalmers HD-21 Hi-Lift loader equipped with a special fork lift, and by a Bucyrus-Erie 71-B equipped with a 3-yd. Esco dragline bucket. Stockpiles of rock for the blanket are built up from the spoil piles by Cat tractors.

Tines on the fork of the Hi-Lift loader have a 10-in. gap which controls the size of rock being dumped; minus 8-in. stones fall through the gap and are rejected. The 71-B has an 80-ft. boom. The machine is used to place riprap for the rock blanket near water level of the channel. When the berm of the bank is too high for the boom to reach down, the crane is barge mounted and works from the water with a clamshell bucket.

Equipment the Badgett firm is using on the section 2 job includes the 450-W walking dragline, used primarily for widening the channel; the 71-B, used to place riprap and level spoil piles; the Allis-Chalmers HD-21 Hi-Lift loader; and four dozers—one Cat D9, two D8's and one D6. The dozers' assignments include leveling spoil piles, helping place the rock blanket, building roads for trucks and other equipment, leveling work sites for draglines; they are also assigned miscellaneous tasks. Rock blanket demands occasionally call for hauling in rock from off-site areas. Twenty-two ton rear-dump Euclids were brought over from the section 3 job in these cases.

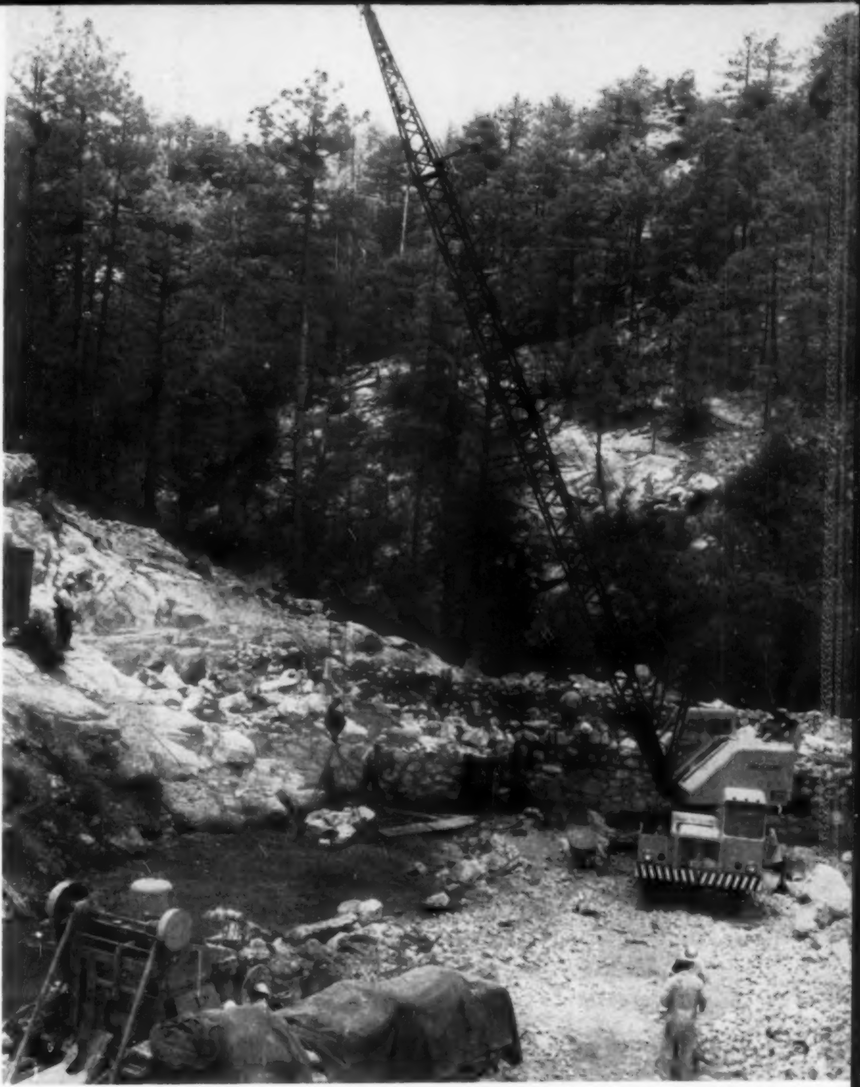
On-the-job maintenance facilities set

Continued on page 65

Plugs of earth must be left where railroad and highway bridges cross the Cal-Sag. These plugs will be removed when new bridges spanning the channel are built.

Goin' Fishin' Real Soon

by Floyd Suter Bixby



Stone pallet is swung by 11-B Transit Crane toward dam. Two-thirds of the dam is constructed of quarried granite; the remaining one-third is 2,500-psi concrete.

A small contractor, getting started, is usually sentenced to a long period of hard work and sweat. The jobs he takes during his probation are supposed to be the mean, tough ones no one else wants—or can do. In his first few years of operation he's certainly not scheduled, by all the rules of contracting, to land a dam job in paradise, where it's cool and peaceful, building a fishing hole for recreation.

John H. Evans & Co., Phoenix, Ariz., has done just that. Close to the top of Mount Lemmon—only 35 miles northeast and above blazing-hot, sweltering Tucson—the four-year old company is hurrying Lower Rose Canyon Dam and Reservoir for the Arizona Game & Fish Commission and the United States Forest Service. The $85,685 job is an unusual project because it's a cyclopean rubble masonry dam, the kind few agencies build anymore.

It's the type of job a small outfit can do exceptionally well, because it needs close personal supervision. It calls only for good organization, a trained crew and adequate equipment. Small machines are okay, if they're dependable. The biggest lifts are granite chunks up to about four tons and ½-yd. concrete batches in Gar-Bro buckets. Drilling is jackhammer work in granite, with small compressors supplying the power.

The job does have problems. For one thing, work couldn't begin until April 7, 1958—and then only in a howling 9-in. snowstorm as key men helped get their trailers in with a tractor. The dam is scheduled to be finished this summer, giving little construction time. The Game & Fish Commission is making sure, after two previous false starts by prison labor and its own hired labor forces, that the reservoir has a chance to fill during the coming winter.

Design of the structure was made by James E. Hastain, consulting engineer, of Phoenix. The 188-ft. long structure is 3½ feet wide at its crest and 40 feet wide at the base. It stands 45 feet above bedrock at its high point. Maximum water depth next to the upstream face will be about 40 feet. The dam has an open ungated spillway, formed in the center, and a 24-in. diameter outlet pipe with Calco stem-type control gate.

The upstream slope of the dam, at 0.0625 on 1, is almost vertical. The downstream slope is 0.65 on 1.

Major quantities include 3,300 cubic yards of rubble masonry and concrete work and 3,100 cubic yards of quarried granite. About two-thirds of the dam consists of quarried granite, while the other one third is 2,500-psi concrete made with sand, cement and 1½-in. maximum size aggregate.

Cyclopean Rubble

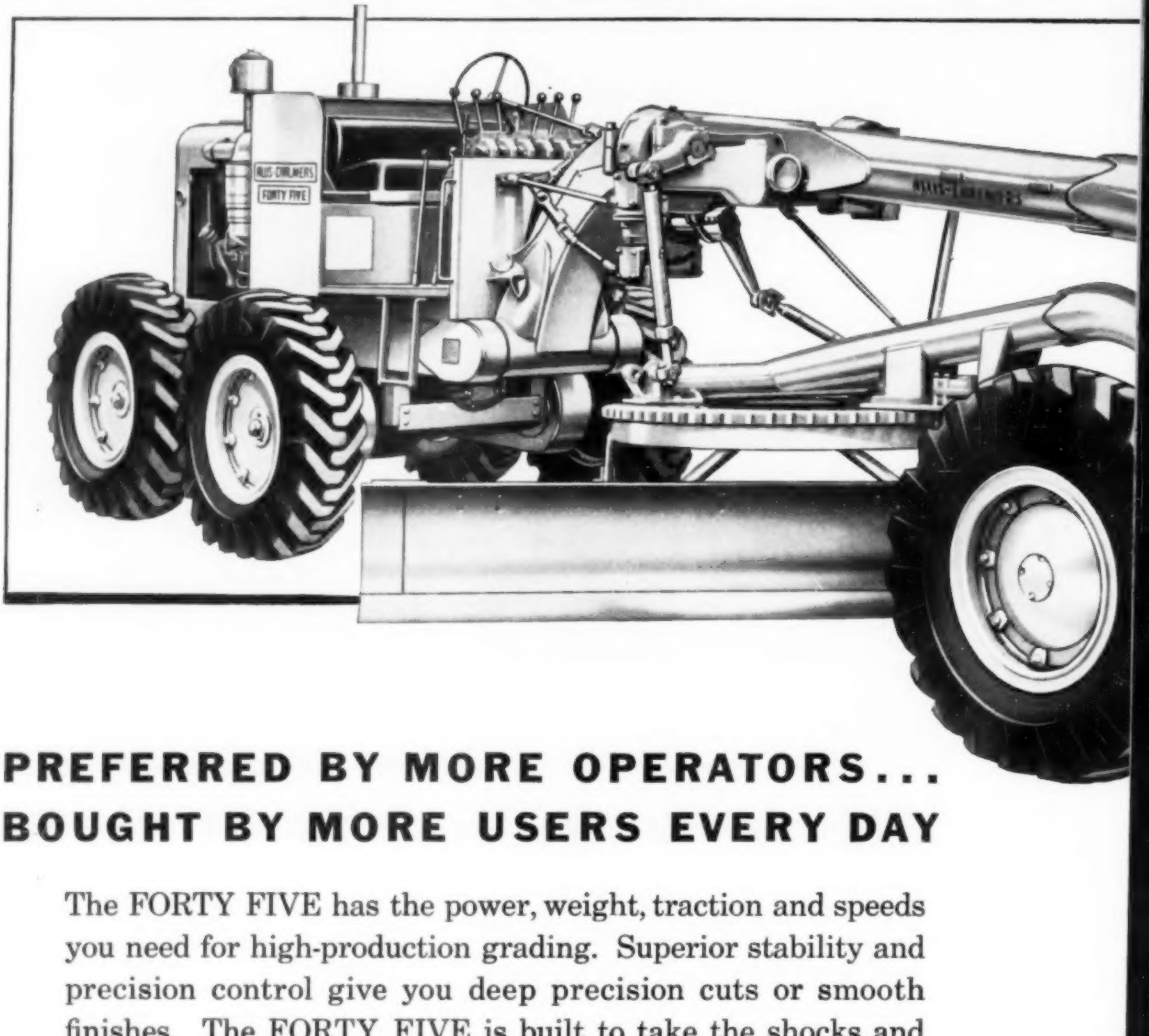
The upstream and downstream faces are hand laid in mortar by experienced stone masons. The center of the dam is being made of the granite chunk and concrete mix, called cyclopean rubble. The concrete mix is checking out closer to 3,000 psi, because nearly six sacks of cement per cubic yard are used.

The dam will entrap a 125-acre foot reservoir in the Lower Rose Canyon drainage, which will be used for recreation. The Game & Fish Commission expects to stock the reservoir frequently

Continued on page 38

Small contractor builds a rubble masonry dam in Arizona mountains to create reservoir for recreational use. Job calls for good organization, a trained crew and adequate equipment.

For consistently tough jobs, compare with any other heavy-duty motor grader



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The FORTY FIVE has the power, weight, traction and speeds you need for high-production grading. Superior stability and precision control give you deep precision cuts or smooth finishes. The FORTY FIVE is built to take the shocks and strains of heavy-duty service — and to keep production steady. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

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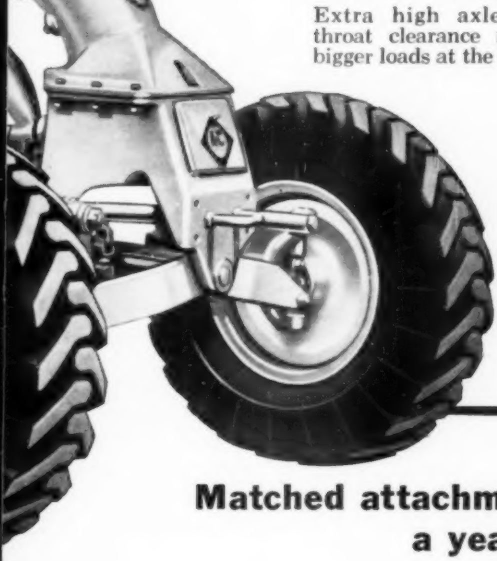
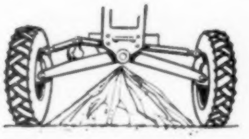
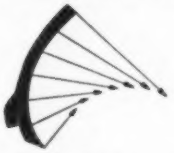
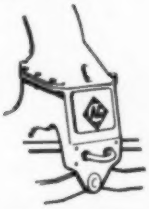




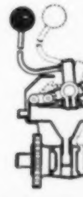
Extra high axle and throat clearance means bigger loads at the blade.



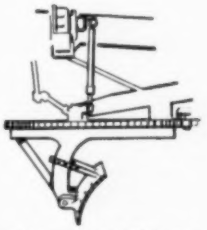
The ROLL-AWAY moldboard rolls dirt, gives more performance per horsepower, more production per gallon.



Fully enclosed power steering — easy control under all conditions.

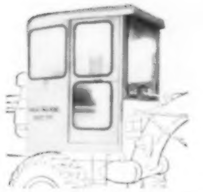


Toggle-type controls are exclusive with Allis-Chalmers.

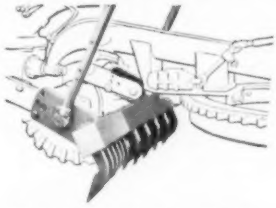


Front-mounted lift cases eliminate long shafts that twist under loads.

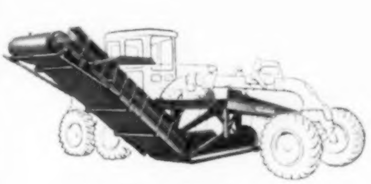
Matched attachments and accessories make it a year-round producer



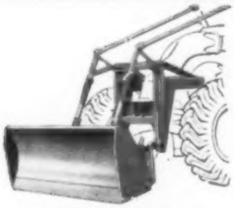
All-steel, stand-up cab



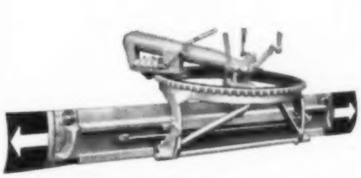
11-tooth, V-type scarifier



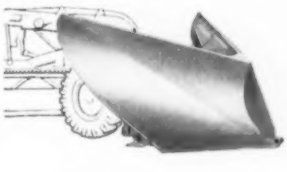
Hancock elevator



8-foot bulldozer



Hydraulic, shiftable moldboard



V-type snowplow

ROLL-AWAY is an Allis-Chalmers trademark.

(Above) Stone is dipped in water to clean away dust and wet rock surfaces so concrete can bond against it more easily. (Right) Mason fits rock into face.

Dam . . .

Continued from page 35

with trout. Since the lake is 7,000 feet above sea level and the locale cool and pine-tree studded, it should be a real recreation center for Tucson sportsmen. Lakes are few and far between in southern Arizona, and water is at a premium.

The area in which the dam is located is in the Catalina Mountains of the Coronado National Forest and has been previously developed for recreation by the U. S. Forest Service. There are many picnic areas on the Mount Lemmon highway out of Tucson. Near the top, close to where the dam is located, there is a fair amount of large timber and wildlife. Whitetailed deer, black bear, coyotes and wildcats are found.

The large pine trees and other growth which covered the reservoir area was cleared by hand labor when the project was started two years ago, using workmen from a prison camp on the highway. The prison labor group was such a rapidly fluctuating outfit—there were five men today and 20 tomorrow— that it was impractical to continue the work with that method.

The commission then hired its own labor force, but was forced to abandon the work because of public pressure. The job was finally advertised to bids by private contractors, and John H. Evans & Co. is now moving so fast that there is little doubt of the project's completion on or before the scheduled date. It will give Arizona a recreation lake at a cost of about $12,000 per surface acre. In easier locations, where earthfill type structures can be used and where the resulting lakes have larger surfaces, the commission has developed the same facilities for as low as $1,000 per surface acre.

Drilling and Shooting

Two types of drilling and shooting are being done. The first type consists of preliminary excavation in rock to get the abutments and foundation down to solid granite bedrock. It was necessary to go down about three feet below surface rock to find a formation sufficiently dense and tight to hold the weight of the structure with minimum pressure grouting.

There is also a small quarry drilling operation, which is necessary to produce the granite chunks for the dam. There are two limits on the size of rock which can be used. The state will not permit dirt or dust to enter the structure and wants all pieces clean for proper concrete bonding. At the other end of the scale, a weight limit is imposed more or less automatically by what the crane can handle. The company purchased a new Bucyrus-Erie 11-B carrier-mounted machine especially for the Lower Rose Canyon job and has been agreeably surprised at its ability to handle 4-ton lifts at low boom angles.

Since the rock is hard granite, it is being drilled with Ingersoll-Rand Carset bits. They give about 500 linear feet before they need to be resharpened. The bits are being used on Gardner-Denver steel, with an Ingersoll-Rand jackhammer. Air power is supplied by Joy and Ingersoll-Rand 125-cfm compressors. The holes are being shot on 4-ft. centers. Column loading of Apache 40% powder, with electric cap detonation, is the method used. The shots are small, but they roll out enough material to keep ahead of the masonry gang.

Building the dam is an interesting

Concrete materials are weighed on Fairbanks scales and mixed with a Jaeger mixer. Jaeger and Rex pumps supply water.

thing to watch, especially since it's so well coordinated. A small crew of 15 men is pushing the work steadily. They manage to bring broken granite, sand, aggregate, cement, water and stone-masonry labor together to make the dam rise rapidly.

The starring role in this drama of concrete and rock is the Bucyrus-Erie 11-B crane. It is handling all materials entering the dam. At one stage of the game, when materials will be handled to maximum height and reach, the 11-B will have 60 feet of boom and a 20-ft. jib. It was used without the jib during the early work stages. The machine handles 75 cubic yards per day.

Broken rock is being handled by an International TD-9 tractor and front-end scoop, which separates the acceptable pieces from rock dust by the simple expedient of shoving the material over a shallow bank. Pieces which a man can handle are stacked up on two special pallets, made of steel reinforcing bars, welded together with cable slings on each corner. These pallets also are used to transport masonry-size rock, especially selected because of their flat faces.

Many chunks of granite break out in pieces too big for men to handle. These are swung over to the dam with the aid of cable slings. A small earthen dike, built just ahead of the large permanent structure, has ponded sufficient water so that each pallet of rock can be dipped before being sent over for use in the structure. Dipping the stone in this way wets the surfaces, cleans off any dust, and makes it easier for the concrete to bond against the rock.

Concrete Specs

The concrete consists of Type II low alkali cement, sand and aggregate up to 1½ inches in size. The contractor is using a Mack LJS tractor with a 20-yd. Fruehauf semi-trailer body for hauling the materials between Tucson and the dam site. Three trips are made each 12-hour day. Sacked cement is being used, because it's easier to handle in small quantities than a bulk product. The materials are being wheelbarrow weighed on Fairbanks scales and mixed by a Jaeger 16S mixer supplied with water by Jaeger and Rex pumps. The cement factor is high—six sacks per cubic yard; but the concrete is being placed with a high-slump consistency, so that it will flow freely around the

A 1-yd. Gar-Bro bucket dumps concrete around chunks of granite to embed them in the dam. Concrete contains Type II low alkali cement, sand and up to 1½-in. aggregate.

embedded granite chunks which make up two-thirds of the dam's volume.

Handling all this material keeps the 11-B busier than any other machine on the job, with the possible exception of the concrete mixer. While the mixer operator is turning out a batch of concrete, the crane operator is busy swinging a pallet of granite over to the dam. By the time he's finished moving the rock, more concrete is ready. Meanwhile, the masonry workers also need pallets of rock for their work, and occasional special batches of mortar—made with sand and cement—must also be turned out and hoisted.

Driller sinks holes with Ingersoll-Rand jackhammer. Ingersoll-Rand Carset bits are being used on Gardner-Denver steel.

Closely coordinated, this operation is accounting for about 75 cubic yards of finished dam volume each 8-hour shift. That figure includes both granite and concrete. By mid-May, after an April 7 start, the dam had been solidly keyed down into parent bedrock, the grouting was finished and the first 15 feet of height was completed. Height progress was expected to accelerate as the dam nears the top.

While Evans & Co. is still a small outfit, it is growing fast. The company's two partners have impressive construction backgrounds. Bob Ewing, for example, a registered civil engineer who had been with the well-known firm of Brandow & Johnston of Los Angeles, Calif., as an engineer-superintendent, made the successful estimates and bid on the Lower Rose Canyon job. He is heading field operations. John Evans had been a field and office operations man for Del E. Webb Construction Co. before he decided, in May 1954, to start his own business.

Broken rock is handled by an International TD-9 tractor with front-end scoop, which shoves material over a shallow bank to separate good pieces for selection by crew.

Also a member of the firm is Lee Myers, a recent engineering graduate who serves as engineer-superintendent on small jobs. The outfit is sufficiently diversified to bid either engineering or construction work, or combinations of both.

The company already has had some impressive jobs. An extensive rehabilitation-improvement program has been completed at Fort Huachuca; a $200,000 eight-story reinforced concrete control tower built at Litchfield naval air facility; considerable U. S. Army Corps of Engineers work has been done; and a combination engineering-design-construction project on the relocation of Air Force access roads also is under way in Arizona. The company is nicely staffed and equipped to do small dams and recently finished the $65,000 Centennial Narrows Dam for the U. S. Bureau of Land Management. These dams are combination water conservation and land use projects.

A 24-in. corrugated metal pipe forms the only water outlet at dam. Calco stem-type control gate regulates water flow.

Rent Special Equipment

Equipment-wise the outfit now owns —in addition to its new 11-B—two International tractors. One is a TD-9; one a model 400 wheel-type machine with Ottawa hoe and loader. In addition to its Mack-Fruehauf combination, the company has 10 Ford trucks from model 250 through F-700's. Also on the list is a Jaeger compressor, Chicago Pneumatic air tools, Grace rollers and heavy repair tools. Special equipment, if needed, is rented.

"We rented a crane for five months to build the Litchfield control tower," said President Evans, "and we've kicked ourselves ever since that we didn't own the 11-B then. It would almost have earned its purchase price on that job. Not only that, but it's big enough to handle about 95% of the crane work we'll be doing in the next five years."

The Lower Rose Canyon Dam should be finished well ahead of schedule, according to both Evans and Ewing. Progress has been good and the quality of work excellent. Grant R. Bingham is directing field operations for the Arizona Game & Fish Commission as resident engineer, reporting to Robert E. Smith, director.

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Let's Talk Tracks

By Thomas C. Kingsley
Service Department,
Caterpillar Tractor Co., Peoria, Ill.

Rough rock work may cause end collar bolts to become loosened. Periodically, inspect and tighten both the inside and outside end collar bolts. Easier access to the inside of the track roller frame is made possible by driving the tractor up on blocks.

Here is part two of an article listing tips on how to increase the service life of crawler tracks. Part one discussing job conditions and operating practices appeared in the August issue.

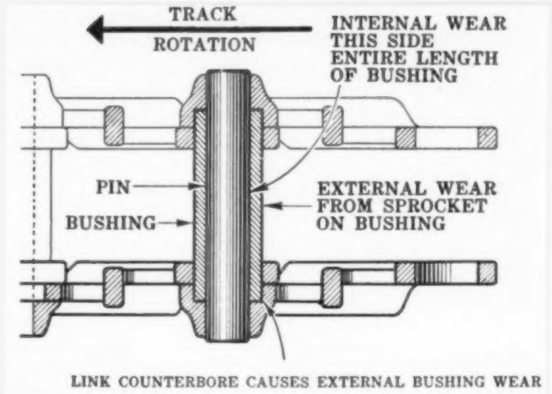
ANY successful maintenance program is based on preventing trouble before it starts. Maintenance should be organized so that every man knows his exact responsibilities. Certainly, the tractor operator should play an important part in this program. He, more than anyone, is in a position to know when a machine is not performing as it should. He should promptly report any condition which requires repair or adjustment to the designated maintenance supervisor.

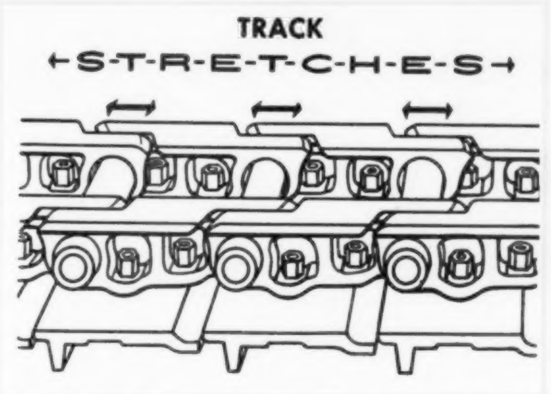
The first item on any maintenance program for the track group is adjustment. Tracks should be inspected for proper adjustment daily. If tracks are allowed to run too loosely, they will sag between the points of support. This causes additional movement and wear between the contact surfaces of pins and bushings. When a tractor with loose track adjustment is driven at high speeds, the track can be thrown off. A thrown track can be expensive both from the damage to its parts and from the downtime needed for repair.

Hydraulic Adjusting

Tracks that have to be adjusted with a wrench are rarely overtightened. However, with tractors equipped with hydraulic track adjusters the opposite is true. All that is needed to adjust this type of track mechanism is a few shots from a lever-type grease gun. The hydraulic pressure puts the track in tension. A few extra shots and the track can be overtightened. Overtightened tracks can also be the cause of overheating pins and bushings. These parts can become hot enough from friction to temper the heat-treated metal and reduce its hardness. Loss of hardness increases wear and cuts service life.

Many tractors are equipped with two-position idlers that may be placed





(Left) Drawing of track section shows points of wear on pins and bushings. (Right) As wear occurs, the track stretches.

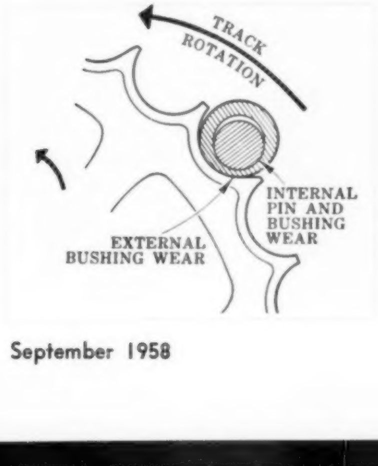
Tension should be checked daily. When maximum limits of adjustment are reached, pins and bushings should be turned.

in a high or a low position. For most applications, idlers should be in the high position. However, when a tractor is equipped with heavy front-mounted equipment, change the idlers to the low position.

When the tractor is equipped with a bulldozer, for example, better balance is attained with the idlers in the low position. The track shoes under the idlers are then in the same plane as the shoes under the rollers. Track shoe grousers, however, are subjected to greater wear since there is a scrubbing action on each grouser as it passes under the idler.

Another major part of any maintenance program is lubrication. Machinery manufacturers continually strive to simplify lubrication requirements. There is always risk in establishing any lubrication interval. If intervals are too frequent, there is always the danger of overlubrication. Blown seals and damaged rollers are usually the consequences. If intervals are too far apart, there is the tendency to forget about those parts. Most manufacturers agree that a middle-of-the-road recommendation is best. This minimizes the danger of overlubrication, but still points up the need for periodic servicing.

External bushing wear occurs where contact is made with sprocket. Since pins and bushings wear on only one side, rotating them 180° will double their life.



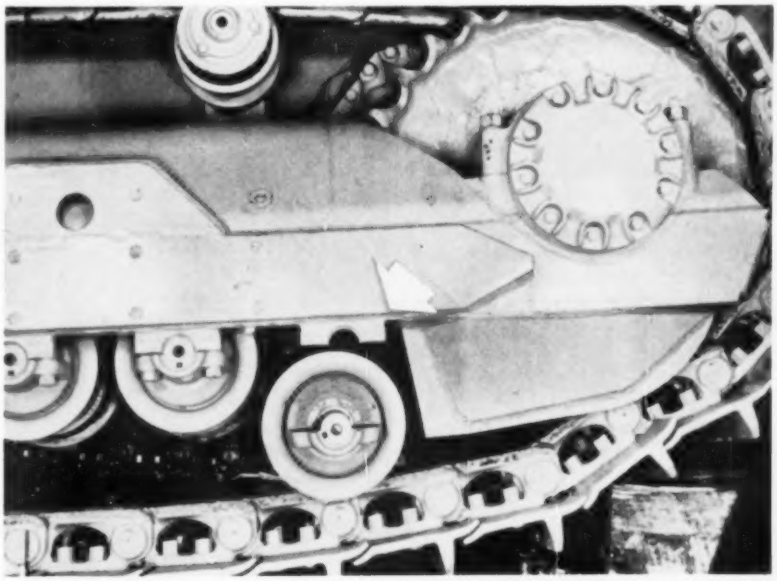
There is only one general rule for track roller lubrication—*follow the manufacturer's recommendations.* A manufacturer specifies the interval for lubrication of track rollers, idlers and carrier rollers in average conditions. Sometimes the lubrication interval must be reduced when the tractor is operating in deep mud or water. Since all lubricants are not the same, the manufacturer also specifies the type of lubricant that will provide the best service in his product. These recommendations are backed up by years of research.

Most manufacturers' lubrication instructions are illustrated and explicit. When followed, they greatly assist in getting the most from a machine. However, these instructions can't eliminate the possibility of introducing trouble. Contaminated lubricants, fittings that aren't wiped clean before being used, over-lubrication or under-lubrication are major causes of shortened service life.

Lubrication Gun

When a hand operated grease gun is used to apply lubricant to roller and idler bearings, apply only the amount needed to feel a slight additional resistance on the gun's handle. Any pumping after this resistance is felt will create enough hydraulic pressure to damage the seals. If pressure can't be built up, it usually indicates a damaged seal. Damaged seals should be replaced as soon as possible.

Power operated pressure lubricant dispensers deliver lubricant in such high



Wear can be equalized by switching roller positions. Drive the tractor onto blocks, loosen track tension and remove capscrews from bearing saddles (see arrow). Remove the forward double and single flange rollers and advance the remaining rollers.

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volume and pressure that a relief valve should be installed in the lubricant line to prevent seal damage. Be sure the relief valve has the proper initial pressure setting. It's also a good idea to periodically recheck that setting. Many rollers have gone without lubricant because a relief valve was unseating at too low a pressure.

Under no circumstances should pins and bushings be lubricated. Dirt combined with oil make an excellent grinding compound. Lubrication of these parts will greatly increase the rate of wear.

The daily inspection should include a critical look at track hardware. Bolts and nuts on the track group should be checked regularly. Since most track parts are subjected to continued stress and shocks, loosened nuts and bolts should be retightened immediately to prevent shearing, loss or damage to the part which they secure.

Regular inspection will reveal minor trouble before it can became a major service problem provided, of course, that prompt maintenance is effected. Guards should be repaired when first found to be damaged, since a damaged guard usually offers little protection.

Check Misalignment

Inspection will reveal major problems too. For example, if an idler is misaligned, it will be evident when the track links or idlers are examined. A misaligned idler will cause wear on the pilot rim section of the idler, wear on the sides of the track links and wear on the roller flanges. On most tractors it is a relatively simple matter to adjust idler alignment with shims located beside the idler bearings.

When a track roller frame member has been hooked on an obstacle and bent slightly, it will cause track misalignment. If the idler cannot be adjusted to the proper alignment, frame members must be straightened or replaced before they cause serious damage to the other track parts.

Turning of pins and bushings can help lower replacement costs. As pins and bushings wear, the track becomes longer and track adjustment is necessary. When the limit of track adjustment is reached, pins and bushings should be rotated 180°. This will nearly double the service life of these parts.

The master pin and bushing should not be used as a guide to determine the wear on the other pins and bushings in the track chain since wear at this point is more rapid. Adjacent pins and bushings, extending along the track on either side of the master pin for one-half the circumference of the sprocket, usually exhibit more wear than the remaining pins and bushings. Experience has shown that periodic replacement of the master pin reduces wear on the pins and bushings close to the master pin.

Prevent Pin Failure

Never intentionally allow pins and bushings to run until failure. This results in accelerated wear to all other track parts. Additionally, track with badly worn pins and bushings causes jumping of the track and rapid wear on the sprocket teeth.

All track rollers under a tractor do not wear at the same rate. It is a profitable practice to switch rollers in the same manner that tires are switched on automobiles. Changing the position of rollers distributes the wear and extends the service life of the roller group as a whole. It is best to change the position of rollers about midway in their normal expected service life. Essentially, changing the rollers consists of removing the forward double and single flange rollers

GIVE
THE UNITED WAY

and, after moving the remaining rollers forward, reinstalling the forward rollers at the rear of the frame. Be sure, of course, that the positions of double and single flange rollers are not changed. Sprockets and idlers can also be switched to equalize wear. This should also be done at the midpoint of their service life.

To determine the wear of links and rollers, check the clearance between the roller flange and the link pin boss. Dealer servicemen should be consulted for maximum wear limits so that rollers and links can be economically rebuilt.

Reconditioning of track and its related parts is a sound investment. When shoes, rails, idlers, rollers and sprockets are rebuilt before they have reached the stage where it is uneconomical to recondition them, these parts will give like new performance.

Dealer Services

In recent years, dealers have developed many new methods designed to cut costs and downtime.

A Minnesota equipment dealer offers firm quotes on building work. Roller, idler and track reconditioning is based on wear. Rollers, for example, are examined to determine the increment of wear. Worn rollers are then exchanged for rebuilt ones. This way the customer only pays for the reconditioning of his own rollers and cuts the time his machine is out of service.

Another interesting service is provided by a Kansas machinery dealer. Under a so-called "loaner" plan, track groups are loaned to a tractor owner at no cost while his track group is being rebuilt in the shop. According to the dealer, savings of up to 60% are possible when track is reconditioned instead of being replaced. The plan also cuts downtime from days to minutes.

Sometimes, of course, parts cannot be economically rebuilt. Track rollers that show excessive wear or have enlarged or bell-mouthed bores, distorted capscrew holes, loose rims or broken flanges, can make rebuilding an unsound investment.[*] In such cases, a new part specified and built by the manufacturer should be installed.

To insure quality workmanship, roller shells should be well cleaned. The welding wire used should meet as close as possible original part specifications for hardness and impact resistance. Many crawler tractor manufacturers have developed standardized recommendations for rebuilding track parts and instituted dealer training programs. This helps assure that reconditioning work meets original part specifications.

Track costs *can* be cut through aggressive preventive maintenance. Review existing procedures. Does the machine have the right track shoes and attachments for the job? Is it being operated properly? Is each member of the organization aware of his responsibilities for day-to-day maintenance? Is lubrication being carried out in accordance with manufacturers' recommendations? Are sprockets, rollers and idlers being switched to equalize wear? Are pins and bushings being turned when the limits of track adjustment are reached? Are track and related parts being rebuilt at the most economical time? If the answer to all these questions is yes, the machine owner can be sure he's getting the track life he paid for.

Rollers can be economically rebuilt if maximum wear limits are properly observed. Dealer servicemen can provide wear limit recommendations for specific machines.

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[*] Exact wear limits for economical reconditioning of track parts can be obtained by consulting dealer servicemen.

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BEST BUY IN NEW AND USED EQUIPMENT

News from the Field

Schedule Safety Congress

Discussion of ammonium nitrate blasting in open-pit mining—a new use for fertilizer that is rapidly gaining acceptance in the mining industry—will highlight mining sessions of the 46th National Safety Congress.

The Congress, annual convention of the National Safety Council, will be held Oct. 20-24 in Chicago, Ill. It is expected to attract 12,500 safety specialists from the United States, Canada and several foreign countries.

Ammonium nitrate blasting, used where no danger of noxious gases exists, will be discussed by James McChesney, mining engineer, Marmoraton Mining Co., Marmora, Ont., at sessions of the mining section of the Council. Speakers at mining sessions will include E. B. Bell, assistant safety director, Ohio Power Co., Canton, Ohio; Irving Hartmann, chief, branch of dust explosions, U. S. Bureau of Mines, Pittsburgh, Pa.; John Nagy, chief, mine experiments section, U. S. Bureau of Mines, Bruceton, Pa.; and M. C. M. Pollard, director of safety, National Gypsum Co., Buffalo, N.Y.

Other talks will be given by R. T. Sullivan, production supervisor, Spanish American Mine, North Span Uranium Mines, Elliot Lake, Ont.; James Westfield, assistant director, health and safety, U. S. Bureau of Mines, Washington, D. C.; Donald F. Cummings, industrial engineer, and Howard Snell, safety engineer, Chino Mines Div., Kennecott Copper Corp., Santa Rita, N. M.; and Herbert A. Wendel, chairman, bureau of safety, Anaconda Co., Butte, Mont.

Wendel, according to John A. Johnson, general chairman of the mining section of the National Safety Council, will tell delegates to the sessions about a unique way to use visual aids in a safety program.

Mobile Soils Laboratory

A completely equipped mobile trailer soils laboratory is currently on a tour of the United States.

The laboratory was designed, built and equipped by Soiltest, Inc., 4711 W. North Ave., Chicago, Ill. It is one of the newest tools for the construction industry, making possible engineering testing of building sites and road foundations on the job site and quality control of building materials such as cement, concrete and asphalt.

The laboratory appeared at the annual meeting of the National Association of County Officials at Portland, Ore., in August. On the West Coast it also was demonstrated at Sacramento, San Francisco, Oakland, Los Angeles and San Diego, Calif.

Stops have been scheduled at Phoenix, Ariz., Albuquerque, N. M., Fort Worth and Dallas, Tex., Oklahoma City, Okla., and Kansas City and St. Louis, Mo.

It will return to Chicago for some local visits in Illinois and Indiana and will then proceed to the East where it will be exhibited at various engineering schools, government installations, and

Continued on page 50

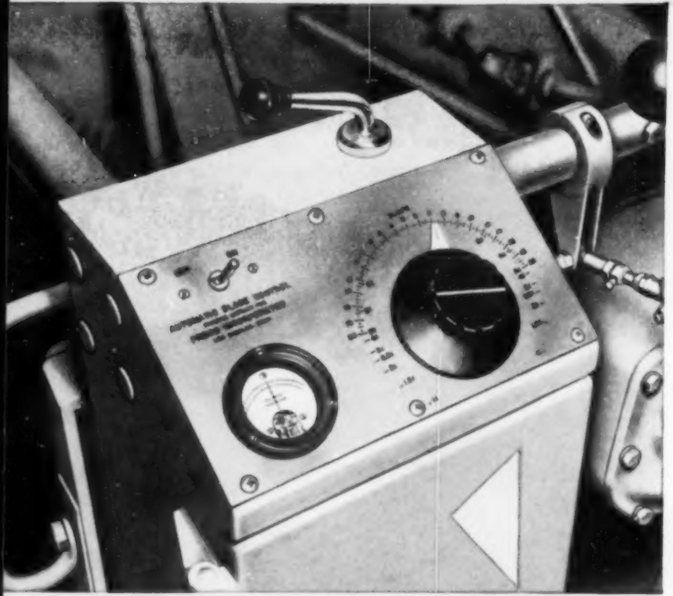
MOBILE TESTING LABORATORY

A model soil testing laboratory is on tour of the United States. The mobile trailer demonstrates testing of building sites, road foundations and quality of materials.

JOB REPORT FROM NEVADA ON

AUTOMATIC BLADE CONTROL

–AVAILABLE ONLY FOR CAT MOTOR GRADERS!



JUST DIAL THE SLOPE ON THIS PRECO AUTOMATIC BLADE CONTROL...

...IT CONTROLS BLADE SLOPE WITHIN ⅛″ IN 10′, REGARDLESS OF TERRAIN!

From job after job, reports are coming in about the performance of the Preco Automatic Blade Control, a major feature introduced last year for exclusive use on Cat Motor Graders. How's it doing? Here's a typical answer from Superintendent Bill Hanson of Isbell Constr. Co., Inc., of Reno: "Work on finish is easier with the automatic control and is very accurate." His remarks are the result of work on a 9-mile, 4-lane freeway project near Carson City, Nevada. As for accuracy, controlling blade slope *within ⅛″ in 10′* can be done!

More improvements for the No. 12

Though the No. 12 has earned the reputation of "standard of the industry," Caterpillar constantly looks for and finds ways to improve this machine. Automatic blade control is an example. Here are some other, even more recent improvements:

Longer main frame—a 4¾″ longer main frame adds extra clearance between toe of blade and front tire for all blade positions.

Better visibility—31% more glass area in cab increases operator's visibility and efficiency.

Increased operator comfort—new seat adjusts fore and aft. Back rest adjustable, too. Cab 6″ higher and cab roof insulated to reduce noise level.

Increased versatility—4″ longer tandem provides plenty of clearance for chains even when machine is equipped with large 14.00-24 tires.

Have you seen the improved No. 12?

Because of these and other new features, you can count on the No. 12 for even better work—and faster. Look it over at your Caterpillar Dealer. Better still, look it over in action. Have him demonstrate a No. 12 equipped with automatic blade control. See for yourself how it steps up production!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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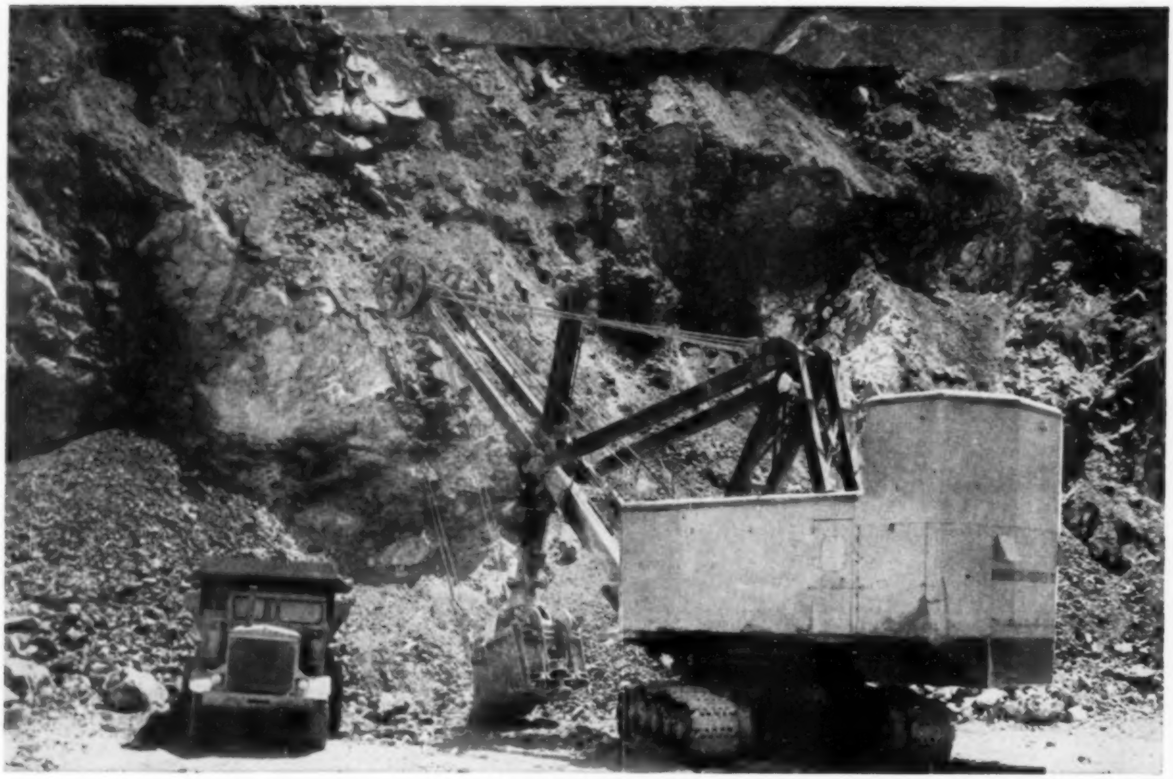
WITH AUTOMATIC BLADE CONTROL

ESCO POINTS and ADAPTERS MOVE 35 MILLION CUBIC YARDS ON SP SALT LAKE CAUSEWAY



ESCO points and wearcap adapters on M-K's dippers are quarrying the 35 million cubic yards of fill material for the mammoth causeway.

EVERY ESCO POINT IS BRINELL TESTED TO ASSURE THE MAXIMUM DEGREE OF ABRASION-RESISTANCE HARDNESS AND LONG LIFE

SEVERE DIGGING CONDITIONS EXPERIENCED

Shovel operators and mechanics, veterans in all types of rock excavation, say they have never experienced such severe digging conditions as the high silica content quartz being quarried by Morrison-Knudsen Company for the 13-mile long Great Salt Lake railroad crossing of the Southern Pacific Railroad.

Increased point wear caused by this highly abrasive material makes the quick-change feature of *ESCO* points an important factor in keeping downtime to an absolute minimum. Easy-to-change *ESCO* points save at least half the time required in replacing bolt-on teeth.

ESCO Cast 12M Points and Adapters Cut Costs 4 Ways:

1. Quick-Change design reduces downtime. Four *ESCO* points can be removed and replaced in only five minutes.
2. *ESCO* points are quickly available for every digging tool from one convenient source.
3. Points feature self-sharpening design. There are eight point shapes to choose from.
4. Cast design permits extra metal at wear points. Points are heat treated and differentially hardened for long life.

See your nearest ESCO dealer. Ask for ESCO Tested Points Catalog No. 187.

ESCO®

ELECTRIC STEEL
FOUNDRY COMPANY
2143 N. W. 25TH AVE. • PORTLAND 10, OREGON
MFG. PLANTS AT PORTLAND, ORE. AND DANVILLE, ILL.
Offices in Most Principal Cities
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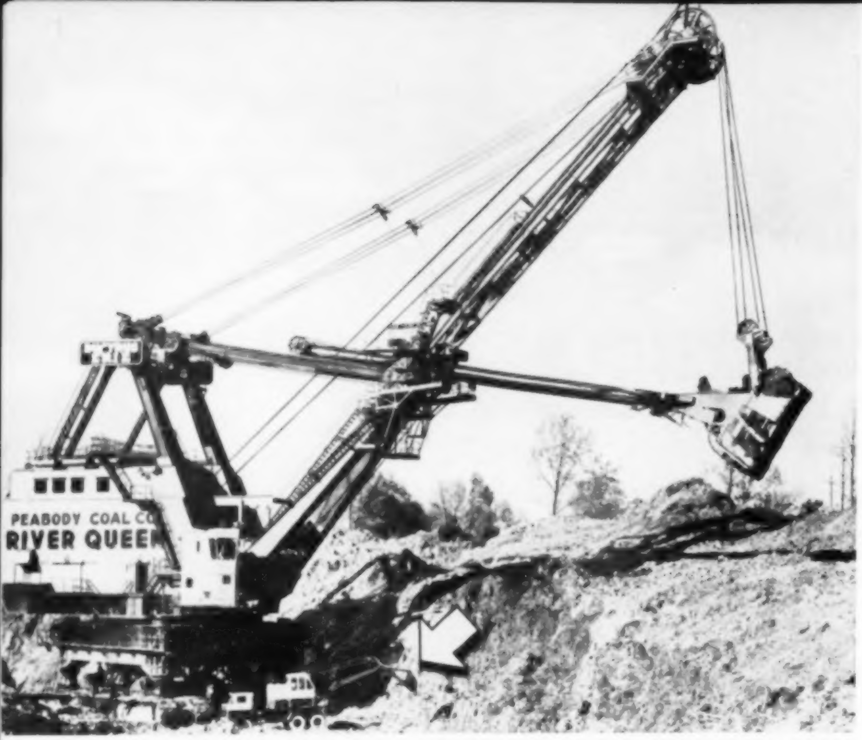


Two excavators at opposite ends of the size scale pose for a photo at the River Queen coal mine, Central City, Ky. They are the 55-yd. 1650-B stripper and 3/8-yd. 11-B Transit Hoe (see arrow). The 1650-B weighs 2,400 tons; the 11-B about 11 tons.

News . . .

Continued from page 46

will be in New York City during the annual meeting of the American Society of Civil Engineers in October.

The trailer lab is air-conditioned and has its own electric generator, lighting system, air compressor, running water, lavatory and heating plant. It contains 135 pieces of equipment, and some 30 separate tests can be performed on soils, concrete, cement and asphalt.

Concrete testing possible in the mobile laboratory includes aggregate classification, air entrainment, sample cylinder compressive strength and beam flexure tests.

Tests for bitumin content, compaction, aggregate studies and compressive strength can be made on equipment included for asphalt testing.

Engineering testing has many features that spell economy for construction work. Gravel explorations along a site can indicate local sources of aggregate which can mean the saving of high priced hauling. The ability to check compaction on the job permits determination of maximum design strength so that operating time of compaction equipment can be kept at a minimum. Soil samples can be quickly and accurately checked for unconfined compressive strength on the site with a mobile testing laboratory, thus eliminating delay and possible disturbances to the sample enroute to a central laboratory.

Concrete quality control testing on the job enables engineers to insure strength and yet make sure that concrete is not over-designed. Both the compressive strength and bitumin content of asphaltic concrete can be established on the job and weaknesses in mixture or design can be spotted immediately.

In general, on-the-spot testing enables engineers to be sure of both foundations and bases and construction materials every step of the way, thus providing against failures in the least expensive way possible.

While Soiltest, Inc. has designed and built mobile laboratories used in 35 countries, this is the first time such a unit has been on tour in the country.

Coal Stripper and Basement Digger Pose

Dramatic evidence of the wide size range of excavators built by Bucyrus-Erie Co., South Milwaukee, Wis., was offered recently when the company's largest and smallest units kept a photographic date.

The *River Queen*, a 2,400-ton stripping shovel, dwarfed an 11-B Transit Hoe that weighs about 11 tons during the session at the River Queen coal mine near Central City, Ky.

The 11-B nearly resembled a play thing next to the *River Queen*, which stands 140 feet high—the equivalent of a 13-story building. The *River Queen* has a 55-yd. dipper; basic capacity of the 11-B is 3/8-yd.

The *River Queen* can remove 80 tons of dirt and rock in a single bite and stack it 100 feet high nearly 300 feet from the digging point. The 11-B would require about 150 passes just to fill the *River Queen's* dipper.

Both the *River Queen*, a model 1650-B stripping shovel, and the 11-B were introduced by Bucyrus-Erie in 1957. The 1650-B's sole job, around the clock, is to strip overburden above coal deposits in the Peabody Coal Company's River Queen mine. Production of the 11-B Transit Machine, a compact crane-excavator, was begun late in 1957.

The 1650-B is one of the largest land excavators in the world. Shovels in the 1650-B series can be equipped with dippers ranging from 40 to 65 cubic yards.

The truck-mounted 11-B is built at Bucyrus-Erie's Evansville (Ind.) plant, about 80 miles from the River Queen mine. It was driven through the Kentucky hills and mud to keep its rendezvous with the 1650-B.

Garage facilities for the 11-B Hoe could be provided by the *River Queen's* dipper.

W. H. Ziegler Dies

William H. Ziegler, 77, chairman of the board, Wm. H. Ziegler Co., Inc., Minneapolis, Minn., died August 5.

He was among the early pioneers of construction machinery distribution.

Mr. Ziegler and his wife lived at 210 W. Minnehaha Pkwy., Minneapolis. Born in Mount Carol, Ill., he was educated in

William H. Ziegler

the public schools of Lyons and Clinton, Iowa, and the Clinton Business College.

Mr. Ziegler was active in civic affairs for many years and was a past president of the Kiwanis Club of Minneapolis, and a trustee of the Kiwanis Foundation. He was a member of the Masonic Lodge and the Minneapolis Athletic Club.

He was one of the founders and a past president of the National Associated Equipment Distributors. He was a past president of the Minneapolis Builders Exchange.

He is survived by his wife, Drusille Louise, two daughters, Helen Elizabeth and Mrs. William J. Benjamin, two grandchildren, Elizabeth Louise and W. J. Benjamin, Jr.

Apportion $3.4 Billion for Roads

A new apportionment to the states of $3.4 billion for highway improvement to continue the national highway program has been announced by Secretary of Commerce Sinclair Weeks.

The apportionment is for the fiscal year 1960, which begins July 1, 1959.

Availability of the fund is being made many months in advance of the fiscal year's beginning to provide ample time to the states for adequate planning of their use of the funds and to insure uninterrupted progress in the program.

"The highway program is on schedule," Weeks said. "As motorists can observe, vast road-building projects are in progress across the nation. Current construction and the use of completed highways will have a favorable impact on the economy. The new apportionments will further accelerate the program."

The federal-aid highway program is under the direction of Federal Highway Administrator Bertram D. Tallamy, who heads the Department of Commerce's Bureau of Public Roads.

The accelerated highway program launched by the Federal-Aid Highway Act of June 29, 1956, and augmented by the Federal-Aid Highway Act of April 16, 1958, has already made available to states $7.15 billion for the fiscal years 1957, 1958 and 1959. The latest apportionment is the largest federal-aid apportionment for highways ever made.

Included in the new apportionment is $2.5 billion for the interstate system. This is $300 million more than the amount apportioned for the fiscal year 1959. The federal government pays for 90% of the cost of interstate roads and the remainder by states.

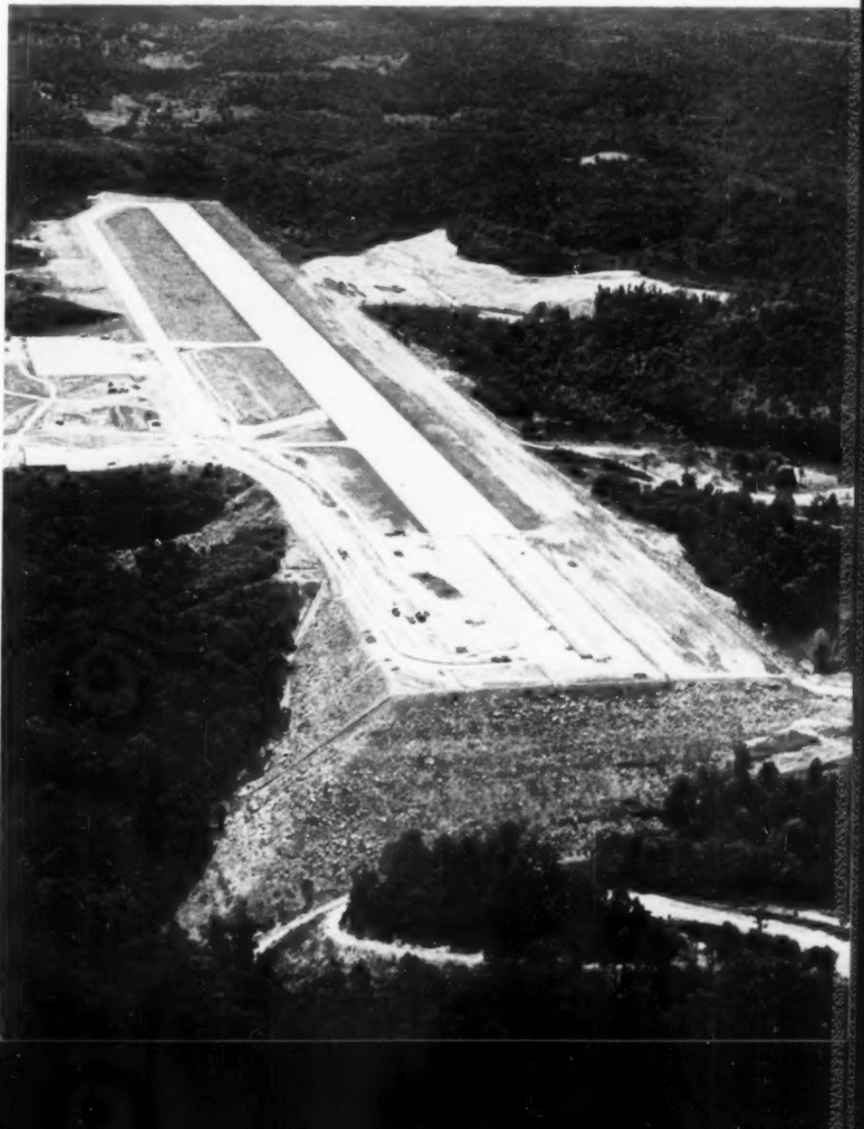
The new apportionment also provides $900 million for the regular or so-called ABC federal-aid program, an increase of $25 million over the fiscal year 1959 amount. In this program the states match the federal funds on a 50-50 basis.

The ABC fund apportionment includes $405 million for the federal-aid primary system, which comprises almost all main routes of travel in the United States and is 250,000 miles in length.

Largest share of the 1960 apportionment, $302 million, goes to California. This amount is $2 million more than the largest annual prewar authorization of federal aid for the whole United States. Second largest amount, $198 million goes to Ohio; New York, with $180 million, is third. Delaware will receive $12 million, the smallest apportionment.

The total 1960 apportionment is larger than the sum of all authorizations made during the first 24 years of federal aid for highways, from 1917 through 1940.

Nearing completion is a 680-ft. long extension to the runway of Tri-State Airport, the "airport built on a mountain-top," seven miles southwest of Huntington, W. Va. More than 2,250,000 cubic yards of earth and rock went into the fill which is 230 feet thick at its deepest point. Burkholder & Burkholder, Alexandria, Va., is the contractor.



Now... 21 yd. struck capacity

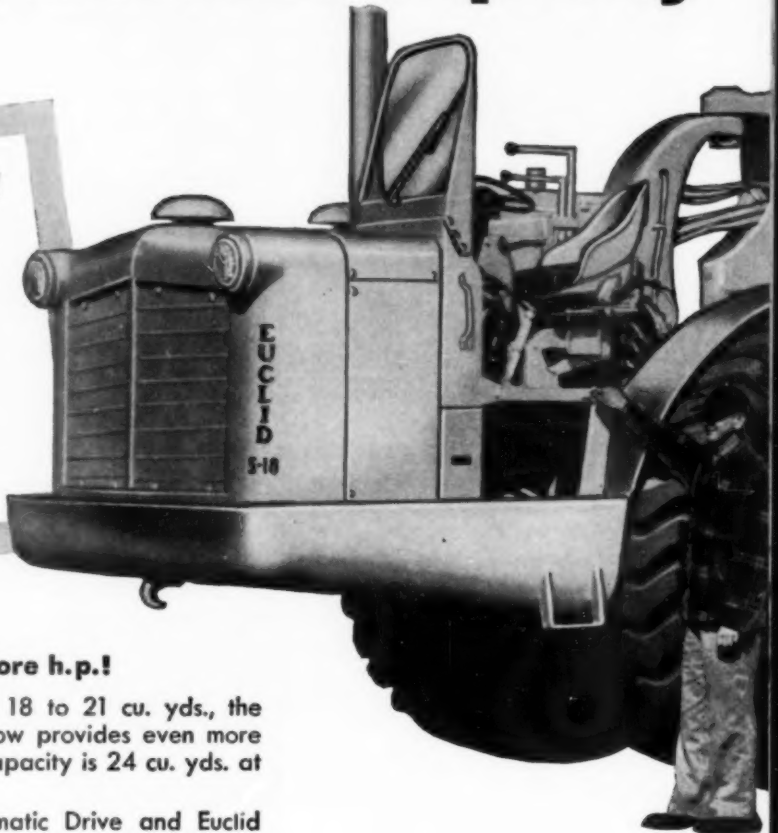
STILL MORE PRODUCTIVE CAPACITY WITH THE NEW S-18

Up to 30 yds. heaped

325 h.p.

Torqmatic Drive with lock-up

Filtered hydraulic system



3 more yards . . . 25 more h.p.!

With struck capacity increased from 18 to 21 cu. yds., the improved Model S-18 Euclid Scraper now provides even more low-cost earthmoving ability. Payload capacity is 24 cu. yds. at 3:1 slope and 30 yds. at 1:1.

The 325 h.p. diesel, 4-speed Torqmatic Drive and Euclid planetary drive axle enable the S-18 to move big yardage at low cost. Converter lock-up in the Torqmatic assures maximum efficiency on grades and long, high speed hauls.

Quickly responsive, full hydraulic steering and the large rolling radius of 27.00 x 33 tires help make the S-18 a highly maneuverable machine, despite its big capacity. Non-stop 180° turns are made in 36 ft. 4 in.

Hydraulic lever action, with only one short cable for the apron lift, provides fast, easy control of all scraper actions and eliminates downtime and expense from cable breakage. Model S-18 incorporates Euclid's original low bowl design with the structural strength needed for working with the biggest pusher tractors. The 4-section cutting blade is adjustable and reversible for efficient loading in any scraper material and longer blade life.

See your Euclid dealer for facts and figures on the improved S-18 with 21 yd. struck capacity . . . he'll be glad to explain the many new production advantages and show you why *Euclids are your best investment.*

EUCLID Division of General Motors, Cleveland 17, Ohio

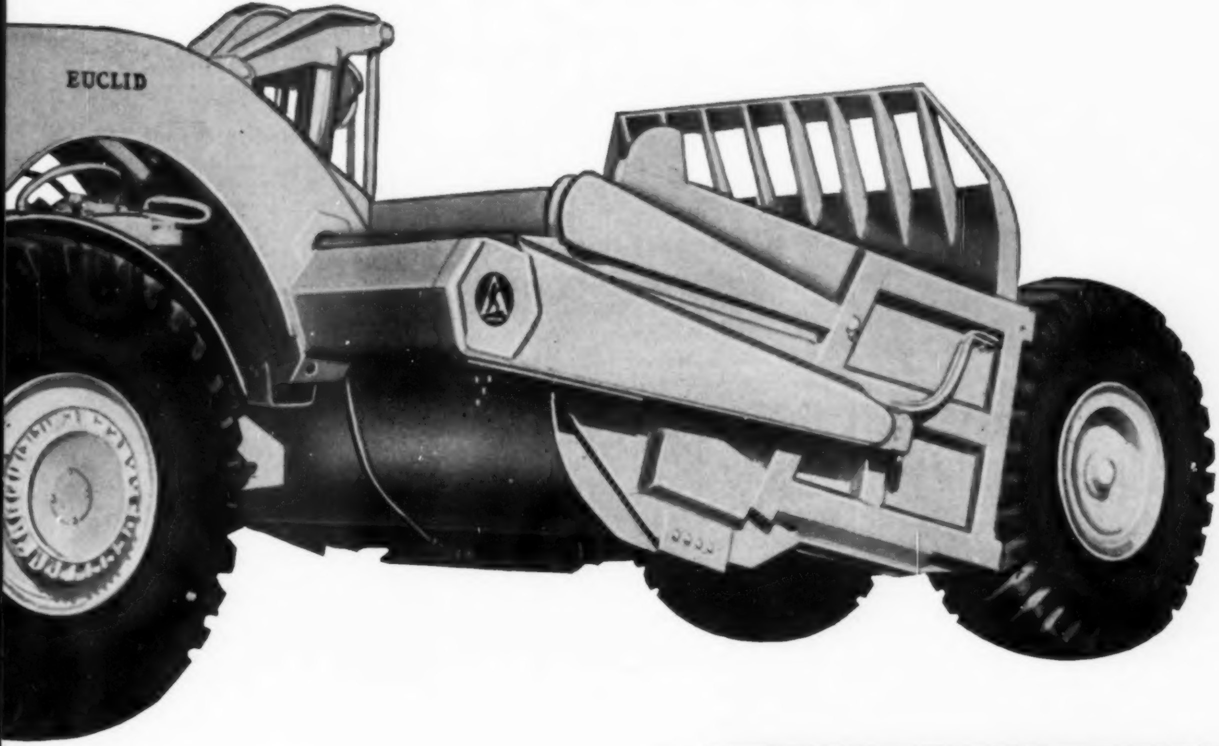
Hydraulic lever action provides fast, independent control of all scraper operations . . . eliminates downtime and expense due to cable breakage. High apron lift and roll-out ejector shed the load fast and clean. Independent control of bowl, apron and ejector permits controlled spreading of the load.

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

in "EUC" S-18 Scraper



Torqmatic Drive pays off in faster cycle time and more production. There's no clutching or loss of momentum when changing to any of the 4 forward speeds. Converter lock-up makes efficient use of engine power on grades and long hauls by providing direct drive.

Four identical and reversible blade sections assure long blade life in any material. Sections can be adjusted to provide the most efficient drop-center arrangement for loading a variety of materials from loose sand to heavy clay, shale and ripped rock.

Low, wide bowl—a feature of Euclid scrapers for years—enables the S-18 to carry more pounds of payload. It has the structural strength needed for push loading by the largest, most powerful tractors such as the Euclid TC-12 Twin Crawler.

22-Ws Bring 2-Way Pay to O. L. Norman

Stepping from their usual task of water well drilling, two Bucyrus-Erie 22-Ws drill blast holes at a Tennessee quarry. They are putting down 6-in. holes to an average depth of 67½ feet, mostly through hard granite-type limestone.

Two of four 22-Ws owned by O. L. Norman & Son, Dickson, Tenn., they have his recommendation for use not only on blast holes but on a variety of well jobs — domestic, farm, industrial, irrigation, air conditioning, etc.

Like so many repeat owners of Bucyrus-Erie drills, this contractor has experienced the 22-W's ability to handle heavy tool strings for fast, efficient production in quarry work. On water well jobs, these versatile rigs have the spooling capacity needed to drill deep holes . . . the fast line speeds to assure "extra" profits.

Dependable, double-duty performance with Bucyrus-Erie 20-W and 22-W drills is worth checking. Write today for the complete story.

131W58

BUCYRUS ERIE

DRILL DIVISION
U.S. Highway 40, West
Richmond, Indiana

Equipment You Ought to Know About

Underbody Hoist

Manufacturer: Marion Metal Products Co., Department EE, Marion, Ohio.

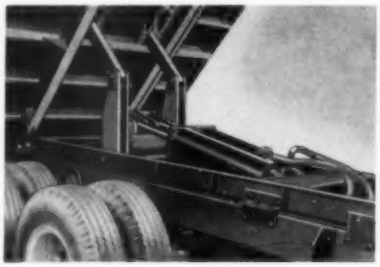
Claims: A heavy-duty underbody hoist for use under very large and heavy contractor dump bodies, has been introduced by Marion Metal Products.

The new HD-88 is a twin cylinder, double-arm type hoist. With a capacity rating of 25 to 30 tons, it's the largest underbody model in the Marion line of hydraulic hoists.

The hoist features a specially designed arm system. The lift arm assembly is an integral steel plate weldment of massive proportions, scientifically designed to give moderate and well-regulated oil pressures. Solid construction of the arm structure protects the hoist frame and cylinders from twisting stress while the body is being raised.

There is no crosshead in the lift arm assembly. The piston rods have solid steel knuckles which attach them to the arm structure.

The sub-frame is constructed as an integral unit, giving increased strength with a minimum of weight. The point of support at the base of the cylinder will withstand extreme horizontal and vertical stresses.



Bearing performance is vital to the successful operation of this type of hoist. The HD-88 is equipped with special non-metallic type bearings at all moving pivots, even in the lift links and cylinder base ears. These bearings operate satisfactory under high loads and under adverse conditions where lubrication may be neglected.

The hoist has twin 8-in. cylinders, which are made of seamless steel tubing honed to a micro-finish with a bolted-type cylinder head. Special combination leakproof seals and rings are used on the pistons, pushed by 2½-in. diameter polished steel piston rods.

High-Velocity Primer

CX-311 PRIMER
DYNAMITE

Manufacturer: American Cyanamid Co., Department EE, 30 Rockefeller Plaza, New York 20, N. Y.

Claims: A new high-velocity gelatin explosive for priming low-cost blasting agents is now being offered by the explosives and mining chemicals department of American Cyanamid.

The product, CX-311 primer, is designed to meet the requirements for optimum detonation of free-running blasting agents in quarrying, construction, stripping and open-pit mining. The primer cartridge, for example, has a 5-in. sleeve of Prima-tube positively attached to and extending along the length of the outer cartridge wall. This sleeve facilitates loading by permitting the primer to slide along the Primacord. It also keeps the Primacord in close proximity to the cartridge.

The CX-311 cartridge is 2½ inches in diameter and 6 inches in length. Each unit weighs approximately 1½ pounds. The company developed this product and package specifically for priming ammonium nitrate (fertilizer grade) and Accomite blasting agent, Cyana-

Continued on page 56

Allis-Chalmers saves you money 3 ways

DO MORE POWER

Provides maximum work per operating dollar—Allis-Chalmers engines give you real *Do-More Power* — with high torque, efficient combustion that squeezes the last bit of energy from every bit of fuel.

Keeps working day after day—There is unusual performance in rugged Allis-Chalmers engines — there is less wear, less that can go wrong.

Gets back to work faster — Design simplicity means easier servicing, too. Allis-Chalmers diesel engines are back to work quickly because you are close to fast parts and service, wherever you are.

See your Allis-Chalmers dealer for full information on engines that save you money, 9 to 516 hp, any fuel, any application. Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS A-C

Koehring Model 205 ½-yd shovel with Allis-Chalmers 273 engine loading copper ore at Tejano Mining Company in New Mexico.

BC-17A

New Equipment . . .

Continued from page 54

mid's high-density nitro-carbo-nitrate product.

Cyanamid has field-tested its new primer in stripping operations in Pennsylvania. The results obtained are reported to be good. The recommended amount is one unit CX-311 primer per 80 pounds of fertilizer grade ammonium nitrate.

Heavy-Duty Crane

Manufacturer: Bucyrus-Erie Co., Department EE, South Milwaukee, Wis.

Claims: A crawler-mounted 30-B heavy-duty crane with greater lifting capacity than the standard 30-B crawler has been announced by Bucyrus-Erie. The heavy-duty crane uses the same upper works as the 30-B Transit Crane.

Long, wide crawler frames and axles provide stability and sturdiness. Standard crawler treads for the heavy-duty crane are 30 inches wide; 36-in. treads are optional.

Standard two-section, welded boom for crane service is 40 feet. The lattice-type boom is constructed of Tri-Ten steel. Single-bolt, butt-type machined joints connect the sections. Special boom-pin connection lugs are available as optional equipment for rapid change of boom lengths. Three boom-point sheaves are furnished. For longer boom, 5, 10, 20 and 30-ft. inserts are available. A spring-cushioned, telescoping-type boom stop is standard equipment.

Maximum load at 10-ft. radius with a 40-ft. boom is 35 tons.

An open-throat upper section on all booms permits the rigging of the hoist rope for 2, 3, 4, 5 and 6 parts of line. At high boom angles, the hoist line can pass behind the sheaves without fouling the boom.

The standard single-sheave 15-ton crane hook block is for 2 or 3-part hoist line. Available as extra equipment are 25 and 35-ton special crane hook blocks for 4, 5 and 6-part lines.

Equipment for power-controlled lowering of load on the main hook is standard, as is pendant-type suspension with mast for all crane booms. Eight-part tackle reeving is used between the A-frame yoke and mast bridle. Booms up to and including 100 feet can be carried with boom point and mast lowered to cab height when special pendants are provided.

Main operating functions of the 30-B are air-controlled.

Dragline Chain

Manufacturer: McKay Co., Department EE, McKay Bldg., Pittsburgh 22, Pa.

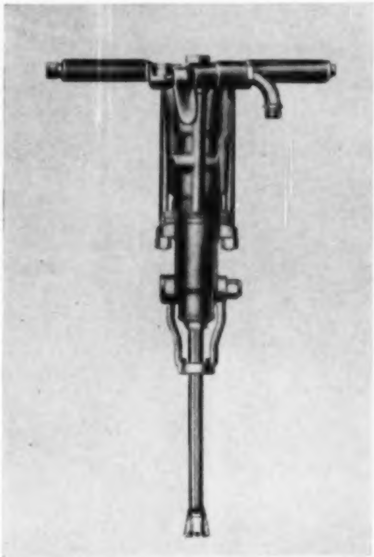
Claims: McKay has introduced a welded austenitic manganese dragline chain. The links of "McK-Manganese" dragline chain are formed and U-welded automatically to produce a chain of uniform strength. The balanced proportions of the individual links combine minimum dead weight with maximum load bearing capacity.

Problems normally associated with casting blow holes or laminations are eliminated through the use of carefully selected manganese steel raw stock and rigid welding and inspection controls in manufacture. After welding, McK-Manganese dragline chain is processed further to produce an initial hardness greater than 22 Rockwell C. In service this surface hardness increases rapidly to 50 Rockwell C.

The new dragline chain is unique in several ways. It is made from selected heats of nickel-modified austenitic manganese steel—the strongest of all chain material commercially available to industry. It has the required ductility to absorb shock, yet it possesses excellent wear resistant qualities because its surface hardens in use. It does not embrittle in work usage and it is non-magnetic.

McK-Manganese welded dragline chain is available in sizes from ¾ to 1½ inches inclusive and in various standard assemblies. Special assemblies may be tailored to individual specifications.

Lightweight Rock Drill



Manufacturer: Ingersoll-Rand Co., Department EE, 11 Broadway, New York 4, N. Y.

Claims: A new lightweight rock drill, called the J-30A Jackhamer, has been introduced by Ingersoll-Rand for applications where a powerful but easy to handle drill is needed. The manufacturer claims the drill is ideal for construction, maintenance and mining work.

The blower valve is incorporated into the throttle valve in the new drill for operating ease and convenience. By merely turning the throttle valve to its rearmost position, the operator directs air under full line pressure through the drill rod and bit to instantly clean the hole of all cuttings.

The J-30A multiple-use backhead design permits easy conversion from the standard blower style drill to the plain dry or wet styles. Nearly all working parts of the J-30A are interchangeable with those of the earlier J-30. The manufacturer says this feature means the Jackhamer can be added to an exist-

Continued on page 58

To give you a double money-makin' edge . . .

HYDROCRANES reach high — HYDROHOES reach deep

Boom extended, the H-5 Hydrocrane lifts a concrete bucket to a third floor pour at Ft. Atkinson, Wis.

BUCYRUS ERIE
HYDROCRANE

The H-5 Hydrohoe reaches down deep on a trenching job in Wisconsin.

Hydrocranes reach way out for long lifts — way up for high lifts. There's over 70 feet of clear lift for the 12-ton H-5, over 60 feet for the 5-ton H-3. Three-dimension boom telescopes in and out, moves over and under, swings left and right — a real working boom for all kinds of lifting jobs around all kinds of construction sites.

Powerful Hydrohoes reach out, too — cut time-consuming truck moves to a minimum. The ⅜-yd. H-3 boom telescopes 3 feet; the ½-yd. H-5, 4 feet. Then, when you want to dig deep, the H-3 hoe can reach down 13 feet; the H-5, 18 feet. This working boom speeds up excavation of pits, trenches, holes, basements. Wrist action permits cleaner dumps, puts dirt further away.

Your Bucyrus-Erie distributor wants to show you these reaching booms and all the other money-making edges of Hydrocranes and Hydrohoes.

242H58C

Other Hydrocrane-Hydrohoe money-makin' edges

- quick convertibility from one attachment to another
- short tail swing for close-quarter jobs
- precise, smooth all-hydraulic control and power
- four hydraulic outriggers form a stable, level work base
- quick setups and knock-downs, up to 50 mph on open roads
- low-cost new or used suitable commercial truck mounting

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

Gentlemen:

I'd like more information on:

☐ H-5 Hydrocrane ☐ H-5 Hydrohoe
☐ H-3 Hydrocrane ☐ H-3 Hydrohoe

Name ……………………………………………

Company ……………………………………………

Address ……………………………………………

City ……………………… State ………………

242H58C

FOR 50 YEARS...
Finest in the Field!

Rely on the bucket contractors rely on. The Omaha Dragline Bucket gives full load with every cast. Perfect balance makes it easy to spot dump. Alloy steel cutting teeth stay sharp, tough and ready. Strike pay dirt now! Complete information and specifications await your letter.

DRAKE-WILLIAMS MOUNT · OMAHA, NEBR.

OMAHA DRAGLINE BUCKETS

New Equipment . . .

Continued from page 56

ing Jackhamer line without increasing parts inventories and storage space.

A new drill steel centralizer has all its working parts enclosed within the fronthead; this keeps out dust and dirt and virtually eliminates maintenance.

The inner parts of the J-30A are coated with a special rust preventative, which aids in "breaking-in" the tool and eliminates the need for greasing the parts for storage. Ingersoll-Rand reports the improved J-30A Jackhamer is offered at no increase in cost over that of the J-30 model.

Nylon Truck Tire

Manufacturer: B. F. Goodrich Tire Co., Department EE, Akron, Ohio.

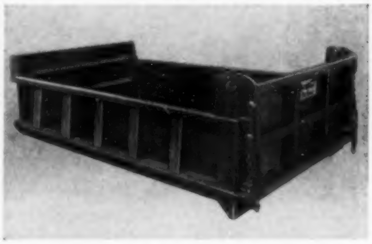
Claims: A new high quality economy truck tire made with all nylon cord has been announced by Goodrich for over-the-road service. Named the "all-nylon heavy-duty express" and made in tubeless and tube-type, the new tire is available in 13 sizes, ranging from 6.70-15 to 10.00-22. The number of plies range from six to twelve, depending on the size of the tire.

The new tire has a Flex-Rite nylon cord body which withstands double the impact of ordinary cord materials and resists heat blowouts and flex breaks. As a result, the tire can be retreaded over and over, giving thousands of extra trouble-free miles of service.

Two chafing strips reinforce the lower sidewalls of the tire. Its special nylon cord construction—each cord is surrounded by "live" rubber—permits the tire to give and take. There are no cross threads to cause crimping and chafing.

BF Goodrich
Silvertown
Express

Heavy-Duty Dump Body



Manufacturer: Gar Wood Industries, Inc., Department EE, Wayne, Mich.

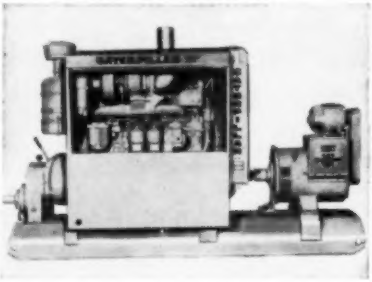
Claims: Gar Wood—St. Paul GC-2 heavy-duty dump bodies now include box-type side braces for greater support for the side panels.

Additional strength is provided by continuous welding around all side braces and the tailgate. A new wrap-around angle brace strengthens the body's corner post and entire rear end, and prevents bending of the floor at the rear edge.

To make dumping easier, the body's tailgate hinge point is two inches higher than the top edge of the tailgate. This prevents the load from exerting a counter force on top of the tailgate, allowing it to swing free without bending or breaking.

The dump body also features corner posts, sides and rear apron that are integrally welded together to form a rigid steel sub-structure. The body's box-section tailgate always fits snug, eliminating bending, twisting and warping. Full length running boards wrap around and weld solidly to the understructure.

Electrical-Mechanical Drive Unit



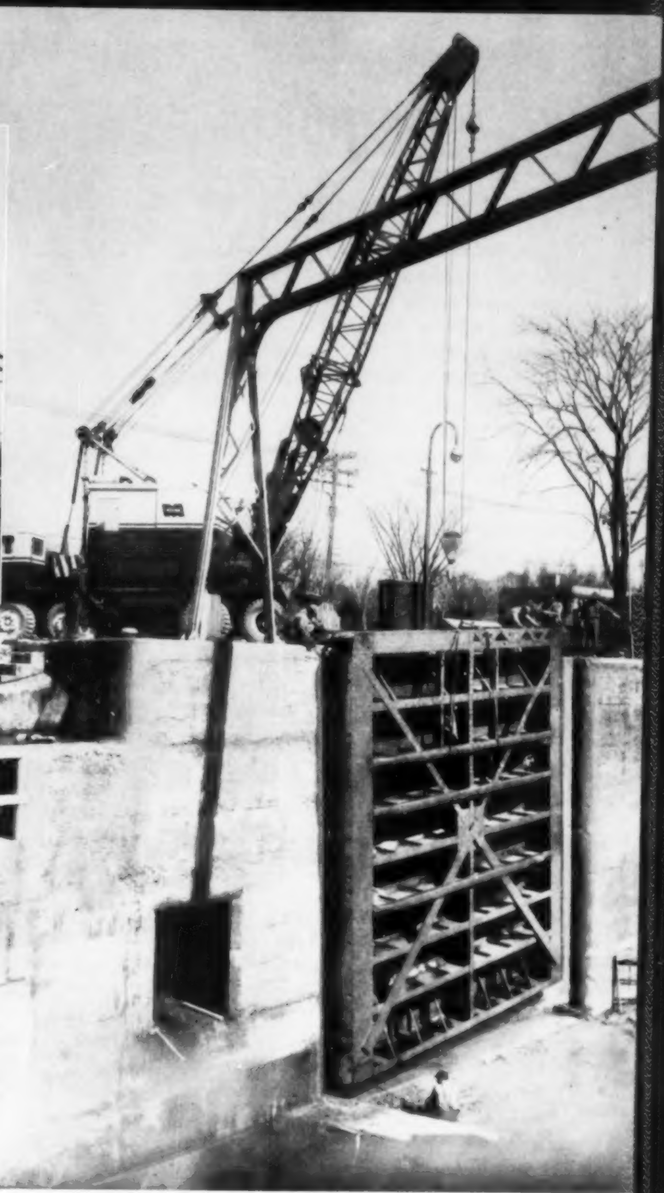
Manufacturer: Caterpillar Tractor Co., Peoria, Ill.

Claims: Design of the new Caterpillar D337 (series F) electrical and mechanical drive unit combines the advantages of both types of drive for crushing plants. The portability of mechanical drive and the flexibility of electricity are brought together into one unit. Simultaneously, the D337 drive unit provides mechanical drive for primary

Continued on page 60

GOING UP...

OVER THE SIDE...



JUST A LITTLE MORE!

40-TON JOB MASTER

Crane lifts .... excavating .... pile driving .... concrete handling .... three-shift operation .... 17-mile commuting between jobs.

Those are only a few of the highlights as this Marion 43-M 40-ton Truck Crane helped its owner rebuild Erie Canal locks in New York state.

Swinging a one-yard concrete bucket 50 feet from the machine, using as much as 110 feet of boom, this Marion won all of its multi-purpose job challenges with honors. Some of the lifts were so far above rated capacity we dare not print them.

Put this versatile, exciting job master on your projects—your nearest Marion Distributor has all of the facts.

You get **MORE** *with* **MARION**

TODAY'S MARIONS GIVE YOU MORE IN SUSTAINED, LOW COST PERFORMANCE

MACHINE	Shovel Capacity	AVAILABLE AS . .			
		Hoe	Crawler Crane	Truck Crane	Special Crane
35-M	¾	Yes	Yes	Yes	——
43-M	1	Yes	Yes	Yes	——
362	1½	Yes	Yes	——	Yes
93-M	2½	Yes	Yes	——	Yes
101-M	3	——	Yes	——	——
111-M	4	——	Yes	——	——

MARION POWER SHOVEL CO. • MARION, OHIO
A Division of Universal Marion Corporation

Send me information about MARION .... yard shovels, ... yard hoes and .... ton cranes (☐ crawler mounted ☐ truck mounted).

☐ Have a salesman call.

Name .... Title ....

Company ....

Street ....

City .... Zone .... State ....

New Equipment . . .

Continued from page 58

and secondary crushers, as well as electricity for conveyor and screen operation.

In this new "look" of mechanical and electric combinations, the D337 drive unit takes power from both ends of the diesel engine's crankshaft. A clutch-controlled Cotta 2 to 1 reduction gear delivers mechanical power at the rear of the engine, while a modified Caterpillar self-regulated constant voltage generator is mounted at the front. The generator produces 60 KW of 240-volt, three-phase current.

With the power units mounted at opposite ends of the crankshaft, they operate independently, allowing either crushers or conveyors to run without the others. Positioning of the generator and reduction gear also provides a shorter, more rigid shaft for each, reducing flexing and vibration. A lower initial cost for this type of power plant is the result of the design, due to the use of a standard-type generator rather than a specially-built unit with a clutch shaft passing through it, as is needed in conventional arrangements.

Designed for crushing plants producing 150 to 200 tph of 1-in. material with 25% oversize factor, the drive unit offers increased production through selectively-fed conveyors. With electric control of belt speed, material pile-up at the hopper can be greatly reduced. Over-all operation is smoother with better control of quality and quantity.

After the electrical and mechanical unit has been installed in a crushing plant, no field adjustments are necessary other than routine clutch positioning and fan belt tension.

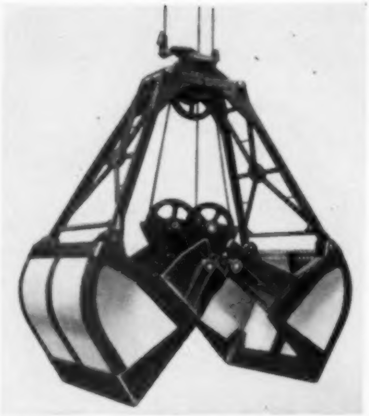
The Cat D337 (series F) diesel engine that powers the new drive unit is rated at 230 bhp at 1,800 rpm. Full advantage is taken of the extra power provided by a turbocharger which uses otherwise wasted gases to drive the impeller. By packing more air into the cylinders, the turbocharger allows the compact engine to supply ample power for both generator and clutch.

Specifications for the drive unit are length 136½ inches; width 45 inches; and height about 80 inches.

Aluminum Clam Bucket

Manufacturer: Owen Bucket Co., Department EE, 6001 Breakwater Ave., Cleveland 2, Ohio.

Claims: Aluminum has been introduced by Owen into the construction of clamshell buckets for the handling of coal and other free-flowing materials.



Use of aluminum in buckets of 3 cubic yards to 10 cubic yards capacity has the advantage of reducing materially the dead weight of the bucket, thereby reducing the load on the crane. The new construction eliminates up to 1,000 pounds of dead weight, depending upon the size of the bucket.

Owen also has incorporated other features to minimize wear and strain on parts, and on the crane on which the bucket is mounted.

Tandem positioning of the lower closing sheaves permits the closing-line lead to function in the center plane of the bucket. This center-line reeving, an exclusive Owen feature, eliminates bending of the cable at the guide rollers as the bucket is hoisted, virtually doubling the life of the cable. It also permits the bucket to hang plumb from the crane boom, eliminating cable wear from the bucket "cocking over."

Cutting edges, corners and other surfaces exposed to rough treatment are made of steel to withstand the abuse to which the bucket is subjected when working in railroad cars, barges and boats.

The high strength, abrasion-resistant alloy aluminum plate is used in side and bottom bowl plates of the bucket. The lighter weight can offset the weight of other desired features, such as equalizer bars or holding sheave blocks.

R DIX
M.D.
EXCAVATING ENGINEER

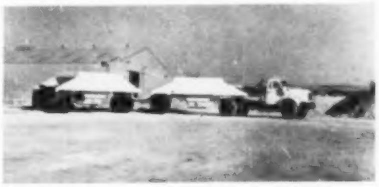
"I got ulcers and the sad thing is I'm still not a success."

These aluminum buckets are individually designed to meet specific job requirements.

Bottom-Dump Trains and Trailers

Manufacturer: Cook Bros. Equipment Co., Department EE, 3334 San Fernando Rd., Los Angeles 65, Calif.

Claims: A completely redesigned and engineered series of bottom-dump hauling equipment, including lightweight and heavy-duty semi-trailers and trains, has been announced by Cook Bros. Of special importance to earthmoving contractors is the fact that this equipment can be fully loaded on-the-move from belt type loaders in less than 15 seconds. Full loads are also unloaded on-the-move in less than 10 seconds.



Foremost feature of the new series is a strong, rugged frame construction. The frames of these units are constructed of square seamless tubing that is said to withstand the stress and strain of hauling on or off the highway and severe shock loading conditions. The outer shell is made of a lightweight, high strength material. A lower silhouette permits easier loading and unloading in either a standing position or on-the-move. It is claimed that the new series holds the road better, fully loaded at regular highway speeds or in short radius turns.

The semi-trailer has a 35-ton payload capacity for off-highway work. It will haul 20 tons or more, legally, on the highway. The lightweight bottom dump trains have a top payload capacity of 28 tons—legal in most states. Optional equipment is available for the "train" series for use in cement hauling and includes aluminum tops, butterfly gates and drop gates.

These People Make Your Machine LIVE LONGER . . . WORK HARDER

The structures and physical properties of all metals used in Bucyrus-Erie machines and replacement parts are important factors in their strength and durability. Here, a metallographic microscope is being used to check the structure of a sample of metal.

Bucyrus-Erie Company spends many thousands of dollars every year testing and developing materials for better wearing qualities under *specific* types of service.

When new metals are employed for better results, and new machinery components are developed, they are passed on to you through the Bucyrus-Erie field service organization—wherever you work.

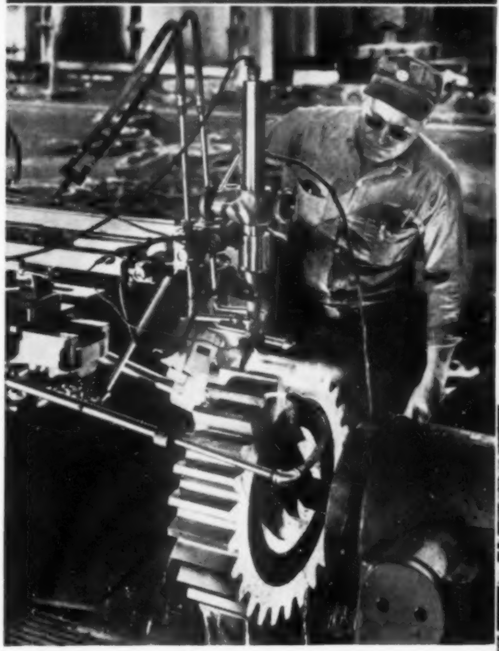
Every replacement part supplied to you by Bucyrus-Erie is made to original equipment specifications— *or better,* if new developments have been achieved. The kind of experience found in Bucyrus-Erie's engineering staff and testing laboratories cannot be duplicated by "will fit experts" *anywhere.*

To keep your machine alive longer, keep it working more profitably, call on the people who designed and built it—call on BUCYRUS-ERIE. 1M58

BUCYRUS ERIE

A Familiar Sign at Scenes of Progress

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN



Gears and pinions which are subjected to hard usage are carefully flame-hardened to provide long life and extra wearing qualities, extra hardness where drive teeth mesh.

In the Orinoco region of Venezuela, where this Bucyrus-Erie 190-B shovel is loading iron ore, dependability is vital. In remote areas especially there's no place for the "will fit expert".

NOT in the Contract

A fellow just called by his draft board happened to remember a friend who had been rejected because he wore a truss. So he hastily purchased one and reported to the board. After the examination he noticed the official had put N.E. after his name.

"What's the N.E. for?" he asked.

"Near East," was the reply. "Anybody who can wear a truss upside down can ride a camel."

"The insurance companies sure ask awkward questions on their application forms," a woman said to her neighbor. "Why, they even want to know the state of my mind."

"How absurd," remarked the other woman. "No doubt you left that blank."

Guest (to host in new home): "Well, old boy, how do you find it here?"

Host: "Walk right up the stairs, and it's two doors to the left."

Two farmers were discussing their sons' progress at the university.

Ezra said, "I don't rightly know what them degrees mean that the boys are working for. Do you, Cy?"

"Reckon so," replied Cy. "The first one is B.S., and you know what that means."

Being a man of the world, Ezra knew.

Cy went on, "Well, sir, the next one is M.S., and that means More of the Same."

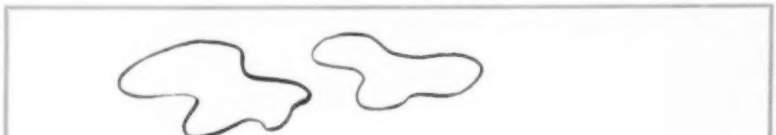
Ezra nodded.

"Then comes the hard part. They study night and day, put in years of work, write lots of papers and then if they're lucky, they get the highest prize of all, the Ph.D."

"And what does that stand for?" asked Ezra.

The answer made sense. "Piled Higher and Deeper!"

Woman driver to her husband: "I scratched the front fender a little, dear. If you want to look at it, it's in the back seat."



"Appearance is important with our company, Cruthers, so let's get a haircut and shave by tomorrow—and perhaps some deodorant under the arms."

This campaigning politician was making an outdoor stump speech in the Arkansas foothills country.

"Look about you, folks," he orated, "you've tilled your fields and planted them, and soon the soft spring rains will come, and the warm, life-giving sun will cause the green plants to sprout and grow and soon your fields will be waving with the tall corn. That, my friends, will be just another of Nature's miracles."

"Hit shore will!" crackled a voice from the crowd. "We planted hossradish!"

Solomon's 999th wife: "Sol, are you really in love with me?"

Solomon: "My dear, you are one in a thousand!"

"In his will your late employer has named you as his beneficiary," said the lawyer.

"It wasn't me, sir," said the girl anxiously. "I know he had one, but it wasn't me, honestly."

Angry motorist: "Say, this car you sold me can't climb a hill. You swore up and down it was a good car."

Salesman: "I didn't swear up and down. I said on the level it was a good car."

The bank cashier recognized the matron as the wife of a leading poultryman, but in totaling her sizable deposit, did not hear her remark that the money had been raised in a drive by the town's Women's Club.

He finished counting, smiled gladly and observed, "Well, I must say the old hens are doing a swell job."

Judge: "Where is Washington?"

Immigrant: "He's dead."

Judge: "I mean, the capital of the United States."

Immigrant: "They loaned it all to Europe."

Judge: "Now, do you promise to support the Constitution?"

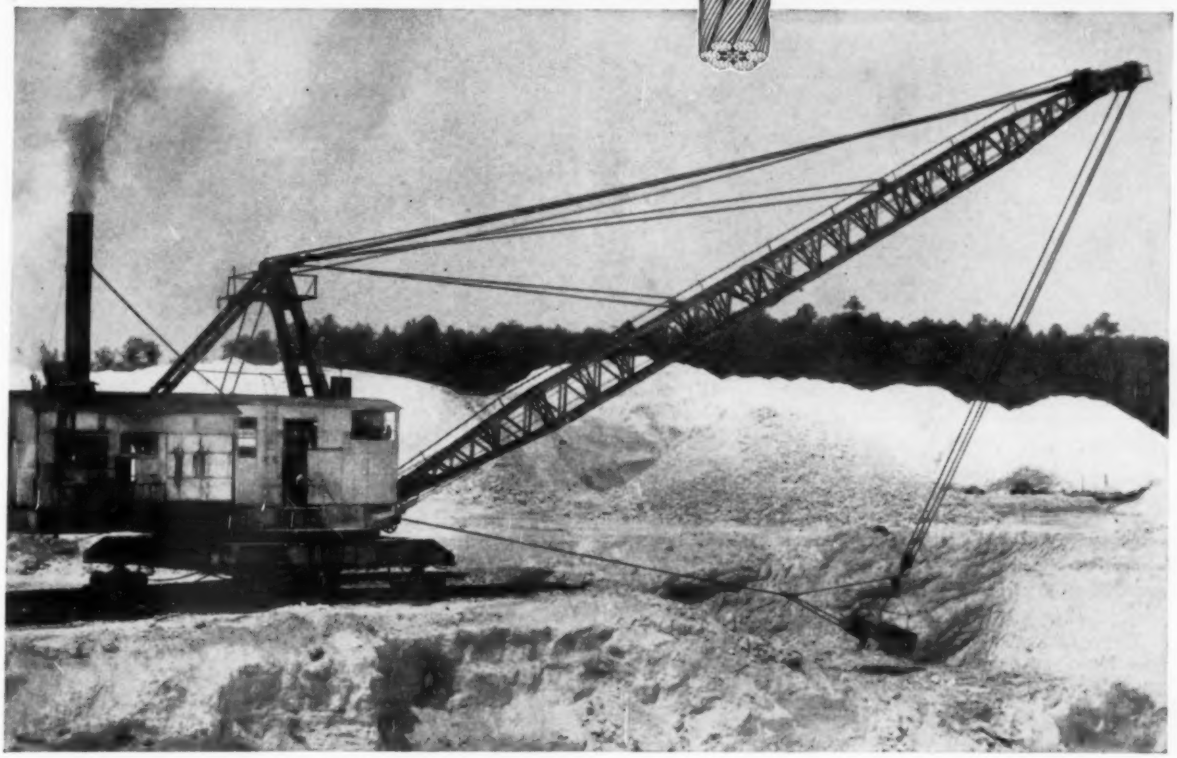
Immigrant: "Me? How can I? I've got a wife and six children to support."

A small wholesaler collected many past-due accounts through the use of the following note on his statements:

"If you will refer to the date of our original invoice, you will note that we have done more for you than your own mother; we have carried you for 14 months!"

for Better Value

American Cable VHS®



KAOLIN STRIP MINER REPORTS

$840 per Year Saved in Downtime Alone using Tru-lay VHS

"The most important part of my job is to keep men and machines producing on a profitable day-to-day basis," says O. E. Robinson, Mine Superintendent, Thiele Kaolin Company, Sandersville, Ga. "Since we started using TRU-LAY VHS on our B-E 6-yard Dragline, we've been able to reduce equipment 'downtime' costs because of wire rope failure to the lowest they've ever been. Our records show we now get an average 8 weeks' service from VHS where 6 weeks' service was tops for our previous brand."

Surely you, too, will want to find out how TRU-LAY VHS can bring big wire rope savings to you. For TRU-LAY VHS saves you money where it counts the most—on the rugged jobs that put any wire rope to its severest test, such jobs as draglines, shovel hoist ropes, scraper and dozer cable.

How is it that TRU-LAY VHS outlasts and outperforms any other wire rope made? It's because TRU-LAY VHS is not just another "brand" of wire rope—it's an entirely new grade of wire rope which is in a class by itself. Before VHS was introduced 3 years ago, TRU-LAY Preformed Improved Plow Steel was the highest rated wire rope you could buy. Today, it still is your wisest choice for many uses. But on those jobs where an extra bonus in strength, toughness, and resistance to wear are called for, you'll be dollars ahead to insist on TRU-LAY VHS.

Ample distributor stocks anywhere in the country now assure you of immediate delivery and an uninterrupted supply of VHS. Ask for VHS next time you order.

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AMERICAN CHAIN & CABLE

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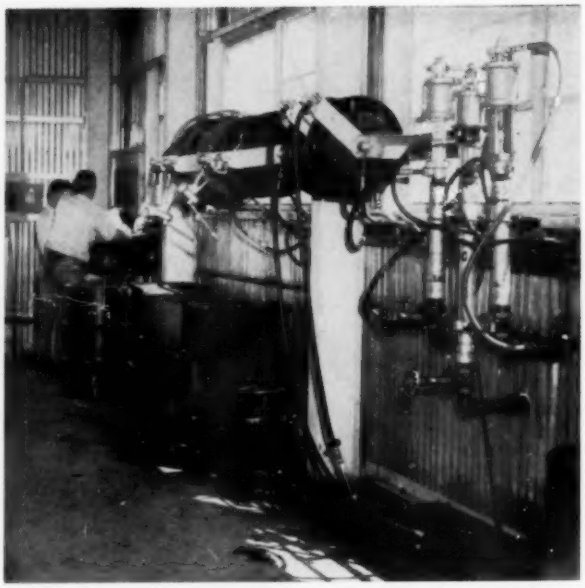
Los Angeles, New York, Odessa, Tex., Philadelphia,
Pittsburgh, Portland, Ore., San Francisco, Bridgeport, Conn.

AMERICAN
TRU-LAY
VHS
PREFORMED
CABLE



(Left) Newest addition to service facilities is this neat drive-through lubrication building housing Alemite lubricators (right).

Kaiser . . .

Continued from page 27

now is being hauled to a new railroad fill, which will bypass the camp area. That will enhance the safety program and make the camp cleaner at the same time.

The ore is being crushed to two shipping sizes, and upgraded to about 60% iron by a beneficiation process, before it leaves Eagle Mountain. First stage in the reduction process is the dump hopper and a 66x84 Birdsboro-Buchanan Blake-type jaw crusher. Its jaws are set to turn out an 8-in. minus product. From this jaw the ore is routed to a secondary crushing plant, where Symons 7-ft. standard and Symons 7-ft. short-head crushers reduce it down to a 1-in. minus product. Screens at this point keep the material in closed circuit with the short-head crusher until it meets that size requirement.

Classifying System

Passing to the top floor of the jig plant, the minus ⅜-in. product goes to the jig feed preparatory classifiers, which separate a 48-64 mesh product. The ⅜ to No. 48 classifier sands pass to a reamer-rougher jig system. The coarse concentrate and hutch products pass to a final concentrate mix; tailings from the rougher jig pass to a cleaning jig; and cleaner tailings products go to the final tailings pond.

From the top floor of the same jig plant, the 1-in. to ⅜-in. material is fed to Stearns magnetic separators, which pick out a concentrate for the final coarse surge pile. Magnetic rejects pass through a heavy-media separation plant, which recovers the remaining fraction of good ore. Rejects from the heavy-media plant are mostly hematite and waste.

The heavy-media plant is equipped to make three products. At the present time its Aikins special separator is turning out two sizes, but a middlings product can also be recovered if necessary. Ferrosilicon is used for the heavy-media solution. Present final products are 1 x ⅜ from magnetic and heavy-media sources; plus ⅜ x 48-65 jig concen-

BUCYRUS ERIE

Master Mechanic C. A. Scott (right) gives directions to one of his mechanics about to take off for a repair lift with the shop's "handiest machine"—an H-3 Hydrocrane.

trates. Another eventual refinement is expected to be the installation of scavenging jigs in the circuit.

While Eagle Mountain's equipment upkeep has been previously detailed in *Excavating Engineer* (March 1953), an important addition has been a drive-through lubrication rack where all big hauling equipment is lubricated in line with manufacturer's instructions. It is equipped with compressed air and a complete Alemite lubricating system. The mobile service trucks also have Alemite systems. Lubricants and greases are manufactured by several oil companies to Kaiser's specifications.

Maintenance of five 1,600-hp Baldwin locomotives, which haul from 70 to 80 railroad cars per trainload to the Southern Pacific Railroad division point at Ferrum, is handled in the heavy equipment shop. This big shop is fully equipped with lathes, precision tools and other gear to keep everything in good condition. Spare diesel engines for various units of hauling equipment also are serviced here.

The camp has also grown somewhat, with new mine expansion. In addition to neat rows of homes for personnel with beautiful watered lawns in this desert vastness, the camp has a school, recreation hall, library, restaurant, baseball field and most of the other comforts of city living. There is even a television line which brings major TV programs direct to the campsite. The hospital is one of the finest anywhere, and an excellent safety program is followed.

General operations at Eagle Mountain are under the supervision of R. G. Heers, manager of mining and raw materials, with Ken Powell as superintendent of raw materials. Martin J. Hughes is manager of the Eagle Mountain Mine.

Ingersoll-Rand Quarrymaster rigs equipped with Carset $6\frac{7}{8}$-in. diameter bits are used to drill hard material.

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CROSBY-LAUGHLIN *Division*
American Hoist and Derrick Company
FT. WAYNE 1, INDIANA

Cal-Sag . . .

Continued from page 34

up by Badgett consist of two semi-trailers equipped with tool shops and one Lincoln and one Hobart welding unit. Major overhaul work is sent to the firm's headquarters at Madisonville, Ky., by means of a fleet of lowboy trailers capable of carrying trucks, tractors, engines and other pieces of equipment.

During October and November of 1957, Badgett maintenance crews accomplished a difficult on-the-job task by resurfacing the circumference of the bottom of the 450-W's tub base with a $3\frac{1}{2}$-ft. wide strip of T-steel. They also overhauled the machine's Cooper-Bessemer diesel engine.

To insure maximum digging loads at all times, the Esco teeth on the Page bucket of the 450-W are replaced twice a week in rock and once a week in dirt.

Union Wire and American Steel & Wire brands of rope used for the drag cable of the 450-W are normally replaced once a month; boom cables are replaced yearly.

Along the entire length of the Cal-Sag Channel, contractors must leave "plugs" of earth where highway and railroad bridges span the channel. These plugs will be removed when new and wider bridges are built.

Bridge construction is being let under contracts independent of the widening contracts. Besides conforming to the new channel width, the 14 highway and nine railroad structures crossing the 16.2-mile Cal-Sag Channel, and other water routes in the system, must have vertical clearances of 25 feet. All bridges will be designed as lift bridges, but lift machinery will not be installed until channel traffic so warrants or until the needed money is appropriated.

Work on the Mary-Badgett joint-venture on section 3 of the widening project is proceeding according to schedule. The 4-mile stretch was successfully bid at $2.7 million and requires the excavation of 2,800,000 yards of common material and 200,000 yards of rock. Equipment being used by the joint-venture to widen the channel includes a Page model 723 walking dragline with 140 feet of boom and a 9-yd. Esco bucket; a Lima model 2400 with 120-ft. boom and a 7½-yd. Hendrix bucket; a 3-yd. Northwest model 80-D; a Bucyrus-Erie 71-B dragline with a 3-yd. Esco bucket; several Cat dozers; and 22-ton Euclid end-dump trucks, which are also used where needed on the section 2 contract.

(Above) A Cat D7 dozer pushes material into piles for a 7½-yd. Lima dragline. (Below) A Page 9-yd. walking dragline widens the channel on the section 3 contract.

Total cost of the Calumet-Sag Channel project is estimated to be $193 million. Of this amount, the federal government's share is $129 million. Local interests will furnish the remaining funds.

Local interest responsibilities call for acquisition of all necessary rights-of-way and spoil disposal areas, the alteration or relocation of obstructive utilities, such as gas and oil lines, and the alteration or removal of restrictive highway bridges. The latter requirement, however, is dependent upon legislation pending in congress and may be modified.

The local interests task fell to the Chicago Sanitary District, since it already owned a great deal of land along the channel right-of-way. Land it did not own it purchased and donated to the channel project. The Illinois Forest Preserve system has proposed to take over a 5-mile long portion of the land along the channel and turn it into a public park. In areas where an out-cropping of rock occurs along the right-of-way, the rock is being sold to contractors who use it for fill on other projects. A private firm is also buying the limestone to make crushed rock products.

Handle Long Tows

When completed, the Calumet-Sag route will have an 11-ft. navigational draw and bridge clearance allowing tows of 10,000 tons or more capacity, consisting of eight barges (195 x 35 x 8 feet) pulled by powerful twin-screw diesel towboats of from 750 to 1,000 horsepower and averaging about 95 feet long by 30 feet wide. At present, commercial traffic over the route is restricted to tows of one or two barges powered by small tow boats, many with retractable pilot houses, capable of passing under existing bridges whose headroom is as little as 14 feet. A towboat 75 by 16 feet (360 horsepower) is reasonably representative.

The Calumet-Sag Navigation Project is being directed by Col. John B. W. Cory, Jr., Chicago District, U. S. Army Corps of Engineers. Resident engineer for the Corps is L. S. Kreger, whose offices are in Blue Island. On section 2 of the Cal-Sag widening project, M. P. Thompson is job superintendent for S. J. Groves & Sons, Inc., the prime contractor. Work on the Badgett subcontract on section 2 is under the supervision of C. W. Badger, a veteran of eight years with Badgett in the coal fields at Madisonville and on the St. Lawrence Seaway job.

"We bought 1 Tournatractor® to replace 2 crawlers"

says pit manager James W. MacDonald

At their Lynchburg Stone Division Pit in Concord, Va., Rockydale Quarries Corporation produces up to 2,000 tons of crushed limestone daily. To meet production requirements, 2 crawler-tractors were used on scattered maintenance assignments around the pit and plant. Since distances between the multiple-tractor jobs ranged up to ½ mi., the slow-moving crawlers lost valuable work-time when traveling job-to-job. What's more, track maintenance ran high because of travel distances over the abrasive footing.

So Rockydale Quarries looked for a more economical type of tractor. They found it in the rubber-tired LeTourneau-Westinghouse Tournatractor. Says pit manager James W. MacDonald, *"We bought 1 Tournatractor to replace 2 crawlers, and also to cut track repair costs. It's very successful . . . we like its speed and versatility."*

Tournatractor quickly clears blasted rocks from watery pit floor. Operator Rodney Arthur says, "Tournatractor is easy to operate. It's powerful, runs good and is fast. With a crawler it used to take me 16 min. to go from pit to plant . . . but with Tournatractor it takes only 2 or 3 min.!"

All-around handyman tool

Lynchburg Stone Division Pit uses their Tournatractor — equipped with 14'10" long Angledozer® blade — as an all-around handyman tool (note sketch). This speedy, rubber-tired tractor cleans-up after blasts and around shovels. It handles general dozing, moves wagon-drills on pit rim, assists stalled trucks, and maintains stockpile. When shovel at plant is down for repairs, Tournatractor takes over . . . pushes rocks from surge pile to hopper, to insure uninterrupted plant production. Rubber-tired tractor also is used to push-load pit's Handyman D Tournapull® scraper on stripping and road-building operations.

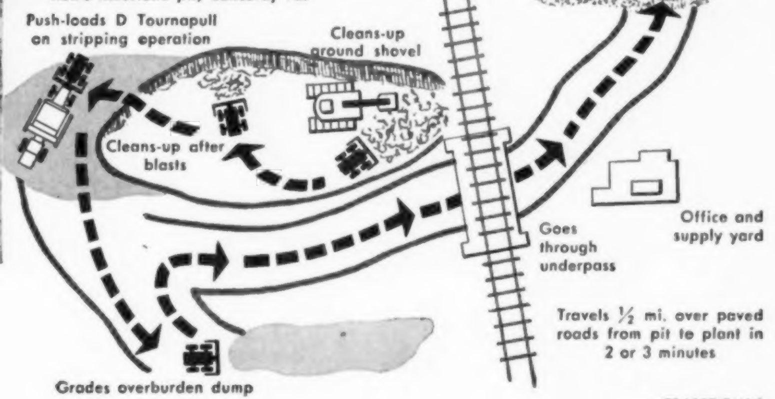
Commented pit foreman Jabe S. Ferguson Jr., "We're all strung out between quarry, plant, and stripping-ends on quarry rim. The Tournatractor hustles back and forth . . . works all over the place. It does a good job."

Try Tournatractor at your pit

If your pit operation is widely scattered or involves abrasive material, why not investigate rubber-tired LeTourneau-Westinghouse 210 hp Tournatractor? You'll find this speedy tractor completes scattered jobs faster, at lower cost. Let us arrange to demonstrate versatile Tournatractor at your pit. No obligation.

Between dozing assignments, 210 hp Tournatractor push-loads 7½-yd. D Tournapull (new "D" has 9-yd capacity) with red and blue clay overburden. Pit also owns a L-W Rear-Dump hauler which is easily interchanged with scraper . . . increases "D" prime-mover's usefulness.

Sketch shows typical hit-and-run jobs handled by rubber-tired Tournatractor during its 8-hr. shift at Rockydale Quarries Corporation's limestone pit, Concord, Va.


Push-loads D Tournapull on stripping operation
Cleans-up around shovel
Maintains plant stockpile
Cleans-up after blasts
Office and supply yard
Goes through underpass
Travels ½ mi. over paved roads from pit to plant in 2 or 3 minutes
Grades overburden dump

CT-1707-QMJ-1

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Where quality is a habit

This "No Contact" feature
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In a Hayward, there's no contact between the closing mechanism and the gravel or other materials handled. To be sure—this "no contact" feature is only one advantage. But a very important one to you—since it means much less wear, reduced upkeep, and a significant dollar-saving in bucket maintenance.

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New Trade Literature

Subject: **Road Compaction**

Content: A 52-page Bros booklet discusses compaction methods and equipment—an area of road construction where much experimenting is taking place and progress is being made. To bring some current problems into focus, the manual presents 10 recently published articles prepared by Bros technical personnel and other experts in the highway field. Subjects of these articles include applications of sheepsfoot, pneumatic-tired, vibratory and grid type rollers; compaction of bituminous surfaces; and stage compaction of cohesive soils. A special useful section is a glossary of commonly used compaction terms.

Where to get: Road Machinery Div., Department EE, Bros, Inc., 1057 10th Ave., S.E., Minneapolis 14, Minn.

Subject: **Pile Hammers**

Content: McKiernan-Terry has published a six-page booklet containing physical specifications and performance data on its line of single-acting pile hammers. The brochure features photographs and sectional drawings of the low velocity steam-air hammers, and includes sectional drawings of various drive caps available for use with these hammers. Also featured is an illustrated explanation of single-acting hammer operating principles, along with pile static load bearing curves for the entire McKiernan-Terry single-acting pile hammer line. Ask for bulletin No. 69.

Where to get: McKiernan-Terry Corp., Department EE, Dover, N. J.

Subject: **Blasting Cost Chart**

Content: A blasting cost chart has been published by Atlas Powder to help users of explosives to compute and analyze true excavating costs. To assist the explosives user in applying the chart to his particular operation, two booklets on the analysis of blasting costs accompany the chart. Printed in file folder form to serve as a permanent record, the four-page cost chart provides space on the first page for recording all pertinent blasting data. Specific cost entries and calculations are made on the inner two pages. The fourth page contains space for pertinent remarks as well as a check list of efficient blasting practices. One of the two accompanying booklets, the *Blasting Cost Control Manual*, discusses the techniques of computing and controlling excavating costs. The second pamphlet gives detailed instructions for using the chart and is titled *How to Use the Atlas Blasting Cost Chart*.

Where to get: Technical Customer Service Section, Department EE, Atlas Powder Co., Wilmington 99, Del.

Subject: **Multi-Purpose Loader**

Content: The International TD-14 crawler tractor equipped with the 4-in-1 Drott skid shovel is described in a new 16-page booklet. The unit can be operated as a bulldozer, bullclam, skid shovel or clamshell. Also featured are nine attachments that can be used. Ask for form CR-635-H.

Where to get: International Harvester Co., Department EE, 180 N. Michigan Ave., Chicago 1, Ill.

Subject: **Highway Officials Directory**

Content: The 1958 edition of the American Road Builders' Association pocket-sized directory, *Highway Officials and Engineers*, is now available. It contains more than 1,700 names, titles, and addresses of administrative engineers and officials in 48 state highway departments, the District of Columbia and the departments in Hawaii and Puerto Rico. Also included are administrative personnel of the U. S. Bureau of Public Roads, heads of its regional offices and division offices in each state; engineers and administrative personnel of toll road authorities; and officers and directors of the ARBA, its eight organized divisions and its Washington (D. C.) headquarters staff. Price is $1.

Where to get: American Road Builders' Assn., Department EE, World Center Bldg., Washington 6, D. C.

Subject: **Wire Rope Lubricant**

Content: A new booklet describes the applications of Whitmore's wire rope lubricant. Formerly called cable composition, the product is used to minimize friction and eliminate corrosion in wire rope on many types of machinery, including draglines, power shovels, elevators and loading equipment. The lubricant is available in a new 16 oz. aerosol spray-on can, as well as the regular bulk containers for drip, brush or automatic lubricating systems.

Where to get: Whitmore Mfg. Co., Department EE, Cleveland 4, Ohio.

Subject: **Caterpillar Booklets**

Content: Two Caterpillar booklets discuss cutting edges for scrapers and dozers and how to choose the right size equipment for job economy. *Hi-Electro Hardened Cutting Edges* is the first of the booklets. It details the phases of testing and manufacturing necessary to develop the Hi-Electro edges. Cutaway sections of the new parts item reveal the depth and configuration of hardness brought about by special heat treating processes. Actual photos taken during "crash tests" emphasize the punishment inflicted on the new edges. Copies are available in English or Spanish. Ask for form DE804. The second booklet, *Balanced Power . . . Matched to the Job*, points out that wasted tractor power means wasted profit. Photos and case histories show how on many jobs medium-sized machines can do the work faster and at lower cost than larger tractors. Ask for booklet D837.

Where to get: Caterpillar dealers or Caterpillar Tractor Co., Department EE, Peoria, Ill.

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—10th of preceding month. Example: January closes December 10th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

Bucyrus 650-B 16-yd. walker drgl. 195′ bm.
Washington 50-ton electric Whirley crane.
American R-25, R-20, elec. Whirley cranes (3).
Barge crane, diesel, Whirley, 75-100 ton.
Clyde 14 elec. Whirley 30-ton pier crane.
Dredges, 4-yd. dipper; 16″ 18″ 20″ Hydraulic.
Gold placer dredges, 4½′, 8′, 12′.
Diesel-elec. generator sets, large (4).
Locomotives, 115, 80, 65, 30 tons, diesel.

H. Y. SMITH CO.
828 N. Broadway Milwaukee 2, Wis.

Bucyrus-Erie 120-B dragline, 100′ boom with gantry mast, 4′ tracks, A-1 condition, located northern California. For sale or lease.

THURMAN & WRIGHT
625 Market Street San Francisco, Calif.

Bucyrus-Erie 750-B shovel, serial No. 9725. Shipped from factory in 1928. Has 95-ft. boom, 64-ft. handle and 20-cu. yd. dipper. Location Ohio. Price: $150,000 as is, where is. Box 3737.

SMALL SHOVELS, CRANES, DRAGLINES — UP to 2½ YDS.

Used H-3 Bucyrus-Erie Hydrocrane mounted on model L160 IHC truck chassis with individual truck cab. Crane complete with hydraulic clam shell and tag line. Also, 29-in. magnet with Onan 5,000-watt, 220-volt, 21.8 amp. motor generator including retriever reels, tag line, etc. Truck chassis has 2,200 miles. Tire size 8¼x 20 ten-ply with hydraulically operated outriggers. Hydrocrane includes telescoping boom with totally enclosed crane cab. All in excellent condition and available for inspection.

WELLS MANUFACTURING CO.
Skokie, Ill.
J. T. Moore

Bucyrus-Erie 38-B crane boom, 85′, complete with mast, pendants, drum lagging and hook block—perfect condition. For details consult—

POLK EQUIPMENT CO.
490 N. Broadway Bartow, Florida

Model 25 Northwest diesel shovel and pull shovel, GMC diesel engine; located in Seattle.

Model 25 Northwest dragshovel with Caterpillar D318 diesel engine; located in Seattle.

38-B Bucyrus-Erie 1½-cu. yd. shovel #85914 with Caterpillar diesel engine, 33″ wide treads, located in Seattle.

54-B Bucyrus-Erie 2½-cu. yd. shovel with Cummins diesel engine and torque converter, 36″ wide treads. Serial #118053. Machine like new. Used under 900 hours.

CLYDE EQUIPMENT COMPANY
3410 First Ave. So. Seattle 4, Wash.

Wellman 2½-yd. dragline bucket. Has never been used. Only $1,500.

Northwest model 80-D, 2½-yd. shovel and dragline, including 60′ boom and bucket. Murphy diesel engine is completely rebuilt. Bargain price.

Koehring model 304, ¾-yd. shovel, dragline, and hoe. Completely overhauled. GMC 4-71 engine has had less than 800 hrs. use. Priced to sell quickly.

Many other bargains in used crawler and wheel tractors, loaders, graders, rollers, scrapers, shovels, cranes and asphalt equipment.

Call, wire, or write NOW . . .

LANG CONSTRUCTION EQUIPMENT CO.
P. O. Box 1646 Salt Lake City, Utah
DAvis 2-1241 TWX Number SU 278

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

SHOVELS AND CRANES

Lima ¾-yd. crane, mounted on Maxi unit. Price on application.

Bucyrus-Erie 22-B, mounted on Maxi unit. Machine is completely re-built and has new machine guarantee, powered with Caterpillar D-318 diesel engine, excellent operating condition, tire sizes 14:00 x 20 tires. Over-all width, 12′3″, over-all length, 22′8″. Price on application.

Bucyrus-Erie 15-B dragline with 35-ft. boom and ⅝-yd. dragline bucket, powered with Buda diesel engine. Price on application.

Northwest, model 25, ¾-yd. track mounted shovel with heel boom loader and Esco log grapple, good operating condition. Price on application.

Bucyrus-Erie 44-B, equipped with shovel front and 60-ft. dragline boom. This machine is being worked over at this time in our shop. Price on application.

Insley ¾-yd. Dragline with dragline bucket and powered with a Chrysler engine. Price on application.

ELECTRIC SETS AND POWER UNITS

Caterpillar D8800 diesel electric set, equipped with base mounted fuel tank, hoods, and mounted on steel skids. Louis-Allis generator, 50kw, 440 volts, 62.5 kva, 3 phase, 60 cycle, self regulating. 110 volt take-off from transformer in control panel. Appears in good condition.

Caterpillar D13000 electric set with G.E. 93.8 kva. 75kw, 440 volts, 3 phase, 60 cycle, reconditioned. Price on application.

D13000 Caterpillar power unit, outboard bearing with 22″ x 10½″ base pulley and 18″ x 12″ base, cast-iron flat pulley on inner bearing. Good operating condition. Price on application.

Caterpillar D17000, serial Nos. 855929 and 856684. Price on application.

GMC 6-71 diesel power unit, mounted on steel base with base contained fuel tank, equipped with V-belt pulley drive. Good operating condition. Price on application.

COMPRESSORS AND HAMMERS

Ingersoll-Rand 315 Gyro-Flo rotary air compressor, powered by GMC diesel engine, has appearance of new machine, in excellent operating condition. Price on application.

Gardner-Denver, model 105 air compressor, mounted on 4-wheeled, rubber tired trailer. Engine overhauled, completely checked over. Good operating condition. Price on application.

Gardner-Denver model WBQ4009 air compressor 284 cu. ft. per min. 6 cyl. compressor, 6 in. low stage, 4¾ in. high stage, 5 in. stroke, equipped for V-belt drive. Good running condition. Price on application.

Gardner-Denver model UMB drill wagon, equipped with Gardner-Denver D89D 3½″ hammer, 4-ft. power feed chuck for 1¼ round lug-shank steel. Price on application.

USED ROAD MACHINERY

LeTourneau Model J, 8-yd. Scraper, 10:00 x 20 tires. Price on application.

Caterpillar No. 80 scraper. Serial No. 5W-561. Tires 75% good, bowl condition good. Sheave and edges good, excellent operating condition. 30-day guarantee. Price on application.

LeTourneau F scraper. Price on application.

Caterpillar No. 212 motor grader. Serial No. 1M-140, equipped with single rear wheels, standard size front wheels, 10-ft. blade, cab, new cutting edges, new glass where needed. Seats recovered, checked over and repainted. Price on application.

Mechanical lift group for No. 12 motor grader. Arrangement No. 4F8771, equipped with a 9B-2049 control for use with Cat or Omaha dozer or V-plow, excellent condition, like new, shows no wear. Price on application.

Slope grader attachment, Grademore. For use on Caterpillar No. 12 motor grader. Used approximately for one month. Price on application.

SMALL SHOVELS, CRANES, DRAGLINES—UP TO 2½ YDS.

Allis-Chalmers model D Maintainer, equipped with 10-ft. moldboard, scarifier, snow plow, rear mounted bucket loader. Appears to be in good running condition. Price on application.

International Harvester TD-18 tractor equipped with Isaacson hydraulic angle dozer, new edges and bits, Isaacson rear mounted double drum winch, roller guards, crank case guards, track and running gear. 80% good. Price f.o.b. Missoula, Montana $2,750.00

Allis-Chalmers HD-21 tractor, serial No. 7638, equipped with Garwood angle dozer and Garwood rear mounted double drum winch. New grouser pads installed, idlers, sprockets and rollers. 75% good, new bits, cutting edges, batteries, cleaned, repainted. Total hours, 2,204 since new. Price on application.

Caterpillar D9 tractor, serial No. 18A-531, in excellent condition, equipped with overhead guard, crank case guard, front pull hook, engine guard, track roller guards. 9A angle dozer and rear mounted No. 29 cable control. All changes to date, 6/1/58 have been made to this machine. 763 hours on the hour meter. 90-day guarantee. Price on application.

Allis-Chalmers HD-20 tractor, serial No. HD-20H 4141, equipped with Caterpillar No. 25 cable control and a U-dozer. Price on application.

Galion 3-wheel, 10-ton roller, serial No. 23555. Price on application.

Universal 20 x 36 primary jaw crusher with 24″ x 25′ feeder conveyor. Price on application.

Pioneer 30-in. x 50-ft. portable conveyor with 10-hp gear motor on cradle truck. Price on application.

Pioneer, 48B crushing plant, model 1940 factory No. CP4811, mounted on 8, 10:50 x 20 rubber tired wheels, vacuum brakes, jaw 10 x 36. Serial No. C-510. Rolls 40 x 22, serial No. 4236. 3½ deck screen, 4′ x 12′, return conveyors 24″ x 25′ and 24″ x 41′. Feeder conveyor 30″ x 50′ on cradle mount, equipped with 25-hp geared motor, delivery conveyor, 30″ x 60′, equipped with 10-hp geared motor. Price on application.

WESTMONT TRACTOR CO.
Box 1445
Missoula, Montana

1—Northwest model 25 crane with 45-ft. boom.
1—Lorain ½-yd. backhoe.
1—½-yd. shovel attachment for Osgood machine, excellent condition.
1—D-4 Cat with Trackson hydraulic loader, 1-yd., 1950 model.
1—Model H Scoopmobile, hydraulic loader, ¾-yd., 1955 model, excellent condition.
1—12 ton single axle trailer (7:50 x 20 tires new) air brakes new.
1—Model C Scoopmobile 22-ft. tower, pallet fork or bucket, excellent condition.
1—Model BB120 Wooldridge scraper, 14 to 18-yd., good.
1—Model 41 Lorain ¾-yd. shovel with Cat. D4600 engine, 1945 model. Needs some repair.
8—105-cu. ft. air compressors, Jaeger, Ingersoll-Rand, Davey, Worthington, Sullivan, Chicago-Pneumatic.
2—365 Gardner-Denver compressors—good.
1—315 Jaeger air compressor—good operating condition.

CONTRACTORS SUPPLY
620 E. 18th St. Kansas City, Mo.
Phone: BA 1-5760

Lorain Model L50-I, 1-yd. shovel, year 1951, 30-in. tracks, long stick, Waukesha engine. Excellent condition $15,000

SYRACUSE SUPPLY CO.
294 Ainsley Dr. Phone: GR 8-3157
Syracuse, N.Y.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Marion Model 93-M, 2½ yd. shovel, Serial No. 21514. Delivered new June, 1956. Powered by Caterpillar 337-F Diesel engine with Twin Disc, 3-stage, Torque Converter. 36 in. pads. Price, F.o.b. Birmingham, Ala.—$57,750. Box 3735.

H-3 Hydrocrane serial No. 81139 mounted on 1950 Chevrolet truck, model 6103. Includes 12′ boom insert and 10′ jib. Price $4,000. f.o.b. St. Louis, Mo. Write: Euclid Sales & Service, Inc., 5231 Manchester Ave., St. Louis, Mo. Attention: Mr. F. M. Shelden.

SCRAPERS

6—CATERPILLAR DW21 tractors with scrapers. All units working well when traded. Each $16,000

6—LETOURNEAU model LS, 4 wheel scrapers. (11-yd. cap.) Excellent condition. Each $3,250

6—LETOURNEAU model LP, 4 wheel scrapers. (15-yd. cap.) Excellent condition. Each $4,500

TRACTORS

INTERNATIONAL TD-24 diesel tractor, torque drive w/crankcase guard, pull hook, elec. starter, canopy top and hydraulic bulldozer. Good operating condition $11,500

ALLIS-CHALMERS HD-20H diesel tractor w/Garwood bulldozer and DD. P.C.U. Operating condition $10,500

CATERPILLAR D8 diesel tractor, with Hi-Output engine, Cat 8S hydr. bulldozer. Certified Buy $15,500

TRENCHER

CLEVELAND No. 95 trencher, option 5, 16″ buckets, 21½″ cut, powered by Continental gasoline engine. Rebuilt. Good value ... $6,600

SHOVEL ATTACHMENT

BUCYRUS-ERIE tunnel shovel attachment for 22-B consisting of 14′ boom, 12′10″ stick, 1 cu. yd. rock dipper, crowd drum, sprocket and crowd chain. Excellent condition $2,200

SHOVELS

BUCYRUS-ERIE 38-B shovel, 20′5″ dipper stick, 1¾-cu. yd. dipper, powered by International diesel engine. Present condition .. $28,000

LORAIN model L820, 2-yd. combination crane, clamshell and dragline, 50′ boom, Rudomatic tagline and fairlead, 35″ pads. Waukesha diesel engine. Rebuilt and guaranteed $35,000

BUCYRUS-ERIE 15-B backhoe, (½-yd.) powered by Waukesha gas. engine w/elec. starter. (shovel attachment available for $1,000) . $7,000

TRUCK CRANES

LORAIN model 40 Moto-Crane, ¾-yd. capacity, with 70′ boom, Rudomatic tagline, outriggers, gasoline engines, mounted on factory carrier with 11:00x20-14 ply tires front and 14:00x20-20 ply tires rear.
Good operating condition $11,500

LIMA Paymaster truck crane, type E34, ¾-yd., 35′ boom, powered by 6 cylinder Buda gas engine; mounted on Brockway 6x6 truck carrier with ten 12:00x24 tires. Reconditioned . $13,000

Subject To Inspection & Prior Sale

H. O. PENN MACHINERY CO., INC.
140th St. & East River CYpress 2-4800
New York, N.Y.

1—Model H-3 Hydrocrane Serial #112568 (capacity 4 tons at 10-ft. radius) with 18-26 ft. telescopic crane boom and outriggers. All hydraulically operated. Mounted on 6 x 6 GMC Army truck. (This machine was delivered new in May, 1955, and has been used very intermittently, good condition.)
F.O.B. Chattanooga $7,000

1—Model H-3 Hydrocrane Serial #111123 (capacity 4 tons at 10-ft. radius) with 26-38-ft. telescopic crane boom and outriggers . . . all hydraulically operated. Mounted on Model F-600 Ford truck. (This machine was delivered new in June, 1954), good operating condition.
F.O.B. Knoxville $8,000

1—Pulpwood Grapple for use with either of above Hydrocranes . . . hydraulically operated.
F.O.B. Knoxville $700

1—Hydraulically operated backhoe attachment, 18-in. bucket, for use with either of above Hydrocranes.
F.O.B. Chattanooga $1,200

POWER EQUIPMENT CO.
1430 Island Home Ave. Knoxville 15, Tenn.

MISCELLANEOUS EQUIPMENT

Bucyrus-Erie 10-B TC combination dragshovel and dragline, standard ⅜-yd. dragbucket, Buda power on excavator, Chrysler power on CCC. This is one of our finest pieces of used equipment.
F.O.B. Denver, Colorado $9,500

Two Allis-Chalmers TS300 scrapers, Buda Diesel engine, 21:00 x 29, 24-ply tires. These machines have been rebuilt in our shop.

1953 A-C model HD-9G, 2-yd. front end loader. Machine has new rails—rollers and pins good. Engine has been shop checked.
F.O.B. Denver, Colorado $11,500

Standard Batch type asphalt plant, 4 compartment bin, scales, pugmill, bucket elevator, feeder pumps, electric motors. Machine does not have dryer or screens.
F.O.B. Denver, Colorado $15,000

Used excavator attachments—
Bucyrus-Erie 22-B shovel attachment .. $1,250
Lorain L-80J, 1¾-yd. shovel attachment complete $3,250
Bucyrus-Erie 54-B dragline boom standard fairlead and counterweight $2,650

THE COLORADO BUILDERS' SUPPLY CO.
1534 Blake St. Denver 2, Colo.
Phone: WEst 5-3571

9-W ENGINE

New, unused Cooper-Bessemer JS-6-D 13″ x 16″ diesel. Current model. Will sacrifice. Contact—

J. E. SMART
Bucyrus-Erie Co. South Milwaukee, Wis.
Phone: SO 2-0900

4—17 yd. Euclids @ $11,500 each.
7—13 yd. Euclids @ $ 7,500 each.
2—13 yd. Euclids @ $ 6,500 each.
1—¾ yd. shovel front for model 41 Lorain.

All this equipment in excellent operating condition and can be seen at 718 Murfreesboro Road, Nashville, Tennessee.

McDOWELL & McDOWELL
CONTRACTORS
P. O. Box 1144 Nashville, Tenn.
Phone: AL 5-0304

650-B Bucyrus Erie Elec. Drag, 195′, 16-yd.
15-W Bucyrus-Erie Elec. Drag, 215′, 13-yd.
631 Page Elec. Dragline, 200′, 8-yd.
9-W Bucyrus-Erie Elec. Drag, 200′, 8-yd.
625 Page Diesel Drag, 150′, 10-yd.
723 Page Diesel Drag, 130′, 10-yd.
621-S Page Diesel Drag, 125′, 7-yd.
200-W Bucyrus-Erie Diesel Drag, 125′, 6-yd.
7-W Bucyrus-Erie Diesel Drag, 180′, 5-yd.
5-W Bucyrus-Erie Diesel Drag, 120′, 6-yd.
2400 Lima Drag, 130′, 5-yd.
4500 Manitowoc Drag, 120′, 5-yd.
3900 Manitowoc Speedcrane, 100′ boom.
3500 & 3000 Manitowoc Crawler Cranes.
750-B Bucyrus-Erie 20-yd. Elec. Shovel.
5480 Marion 18-yd. Elec. H. L. Shovel.
170-B Bucyrus-Erie 6½-yd. Elec. Shovel.
120-B Bucyrus-Erie 4-yd. Elec. Shovel.
1400 P & H 4-yd. Elec. Shovel.
Large selection of smaller Shovels and Draglines available.
Model T-750 Reich Truck Mounted Rotary and Down-the-hole drill.
Lima Model "C" Roadpacker.
Euclid Trucks, Truck Cranes, Dozers, Scrapers, Front End Loaders, Drills, Buckets, Attachments and other misc. equipment available.

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l. Bank Bldg.
Hazleton, Pa. GLadstone 5-3658

New Bucyrus-Erie 51-B hoe—28′0″ boom and machinery, 15′0″ handle, 2-cu. yd. heavy-duty, solid type dipper with blade type side cutters, 66″ overall width, padlock, auxiliary gantry and ropes. This hoe has been used less than 30 days. Hoe carries a new Bucyrus-Erie warranty at a substantially reduced cost. Any inquiry by letter to—

THE COLORADO BUILDERS' SUPPLY
1534 Blake St. Denver 2, Colo.
Phone: WEst 5-3571 at Denver

22-B Bucyrus-Erie shovel front, ¾-yd., original crowd and retract cables—like new.

RALPH LEE
Gonvick, Minn.

MISCELLANEOUS EQUIPMENT

Model 27-T blast hole drill, serial No. 18269, Waukesha gasoline power, crawler-mounted, 33′ one-piece all-steel derrick complete with tools in good working order. Located in Missouri. Priced to sell. Box 3718

Caterpillar D9 diesel tractor serial 18A1296 equipped with Cat 9-S bulldozer, Cat No. 30 front cable control, Ateco HRD9 rear hydraulic ripper, lights, starter, rock guards, crankcase guard. Excellent condition $47,500

Caterpillar D8 diesel tractor, serial 14A1447 equipped with Cat 8-A angledozer, Cat No. 30 front cable control, electric starter, track roller guards and crankcase. Very good condition. $21,500

Caterpillar D8 diesel tractor, serial 2U10289 equipped with Cat 8U bulldozer, Cat No. 25 rear cable control, electric starter, crankcase guard and 22 in. tracks. Fair condition .. $8,000

Caterpillar D8 diesel tractor, serial 2U20642 equipped with Cat 8S bulldozer, Cat No. 25 rear cable control, electric starter and crankcase guard. Poor to fair condition $6,000

Caterpillar D8 diesel tractor, serial 2U16576 equipped with Cat 8A angledozer, Cat No. 24 front cable control, electric starter and crankcase guard. Fair to good condition $6,200

Caterpillar D8 diesel tractor, serial 2U10506 equipped with Cat 8A angledozer, Cat No. 24 front cable control, and Hyster D8 worm drive winch. Good condition $8,500

Caterpillar D8 diesel tractor, serial 2U9403 equipped with crankcase guard and Trackson MD8 pipelayer with counterweights. Good condition $9,500

Caterpillar D8 diesel tractor, serial 2U7940 equipped with electric starting, crankcase guard and Trackson MD8 pipelayer with counterweights. Good condition $9,500

Caterpillar D7 diesel tractor, serial 3T7402 equipped with LeTourneau cable and angledozer and Gar-Wood rear cable control. Good condition $8,500

Caterpillar D7 diesel tractor, serial 3T10312 equipped with crankcase guard and Trackson MD7 pipelayer with counterweights. Good condition $7,200

Caterpillar D7 diesel tractor, serial 3T10452 equipped with electric starting system, crankcase guard and Trackson MD7 pipelayer. Good condition $7,800

Caterpillar D7 diesel tractor, serial 3T12656 equipped with electric starting system, crankcase guard with pull hook and Trackson MD7 pipelayer with counterweights. Good condition. $7,800

Caterpillar D6, 74 in. diesel tractor, serial 9U1227 equipped with electric starting system, 7-roller non-oscillating track frame and Trackson model T6 front mounted cable loader with 1¼ cu. yd. bucket. Very good condition $6,500

Caterpillar D4, 60 in. diesel tractor, serial 5T7137W equipped with electric starting system and Trackson model 1T4 front mounted cable loader with 1 cu. yd. bucket. Good condition. $1,750

Three (3) International model TD-14 diesel tractors equipped with Tulsa, Carco and Isaacson rear mounted towing winches. Fair condition. .... Each $2,250

R. L. HARRISON CO., INC.
1801 4th St., N.W. Albuquerque, N. M.
Phone: 7-881

Cleveland "Baby Digger" wheel ditcher. A good buy. Only $2,100.

Yale electric crane, 6000 lb. capacity, 12′ to 18′ telescopic revolving boom. 1953 model. Present price over $17,500. Our price only $4,750. Has never been used.

LeTourneau Tourn-a-dozer, completely overhauled. Buda 6DC engine. Make an offer.

Barber-Greene model 879-A asphalt finishing machine. Excellent condition.

Adnun black top paver, S/N 1462. Ready to go to work. Low price.

Many other bargains in used crawler and wheel tractors, loaders, graders, rollers, scrapers, shovels, cranes and asphalt equipment.

Call, wire, or write NOW . . .

LANG CONSTRUCTION EQUIPMENT CO.
P. O. Box 1646 Salt Lake City, Utah
DAvis 2-1241 TWX Number SU 278

ONE—2¼-YD. COAL LOADING DIPPER, NEW FOR 38-B. LOCATED NEAR PITTSBURGH. $2500.
BOX 3720

MISCELLANEOUS EQUIPMENT

2—3 cubic yd. type "BM" medium duty, thoroughly reconditioned dragline buckets complete with all fittings. Weight 4800 pounds each. Special reduced price $2,508 each. F.o.b. Evansville, Ind.

BUCYRUS-ERIE COMPANY
Evansville, Indiana

3—29-T Bucyrus-Erie Wire Line Blast Hole Drills.
2—42-T Bucyrus-Erie Wire Line Blast Hole Drills.
1—New RCA Metal Detector—10"x36" Aperture.
1—Fuller-Kinyon System.
1—Second-hand Drop Ball (3200#).
9—New Well Drill Bits—3¼"x4¼"—7 API Joints.
2—Pennsylvania, Class DE-2, two stage, duplex, cross compound, (direct connected), Synchronous Motor Driven Air Compressors.
  Low Pressure Air Cylinder Diameter ...20"
  High Pressure Air Cylinder Diameter ...12"
  Stroke ....14"
1—4'x6' Kennedy Van Saun Double Deck Vibrating Screen.

NEW YORK TRAP ROCK CORP.
Old Mill Road, West Nyack, New York
Phone: NYack 7-4500

Model 27-T blast hole drill, serial No. 19628, Waukesha gasoline power, crawler-mounted, 33' one-piece all-steel derrick complete with tools in good working order. Located in Missouri. Priced to sell. Box 3719

3—New, unused, 3 cu. yd. type "BU", Bucyrus-Erie lightweight dragline buckets with all fittings. Weight—5150 pounds each. Special reduced price—$2000 each. F.O.B. Evansville, Ind.

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

29-T churn drill parts available in Los Angeles. Contact: Kaiser Steel Corp., Equipment Dept., 612 S. Flower St., Los Angeles 17, Calif.

1—Used ⅜ cu. yd. double ram clamshell bucket for H-3 Hydrocrane. Special reduced price $700. F.o.b. Evansville, Ind.

BUCYRUS-ERIE COMPANY
Evansville, Indiana

Index 601—Caterpillar D8, serial 2U18302 w/8A blade, serial 18C5985 and #25 cable control unit, serial 9D27991.
  Certified buy $16,000
Index 404—Caterpillar D4, serial 6U8400 w/4A angle blade & #44 hydraulic control.
  Bonded buy $5,000
Index 582—Caterpillar D4, serial 7U5415 w/4A blade, serial 6F136 and #44 hydraulic control, serial 7V6812.
  Price $7,500
Index 552—Caterpillar D17000 engine serial 8S6968.
  Bonded buy $7,500
Index 457—Caterpillar #70 scraper, serial 3W5975.
  Certified buy $9,000
Index 494—Caterpillar #463 scraper, serial 62C272.
  Bonded buy $14,000

GILES & RANSOME, INC.
2729-33 Hunting Park Ave.
Philadelphia 29, Pa.

48-L—Two new unused Waukesha 6WAKU 6 cyl. 6¼ x 6½ in. natural gas-gasoline engines.

40-R-48-L—One new unused Cat. D337 6 cyl. 4¾ x 6½ in. diesel engine.

50-T—One new unused IHC UD-18A 6 cyl.. 4¾x 6½ in, diesel engine.

1-W—One rebuilt IHC U-1 4 cyl. 2⅝x2¾ in. gasoline engine. Never operated after rebuilt.

Above engines offered as is F.O.B. South Milwaukee, Wisconsin subject to prior disposition. Will sacrifice for quick sale.

J. E. Smart
Bucyrus-Erie Co. South Milwaukee, Wis.
Phone: SO 2-0900

MISCELLANEOUS EQUIPMENT

1—Front mounted Tractomotive Backhoe attachment for Allis-Chalmers Model HD-5 tractor. Like new. Priced to sell.

SCHROEDER CONSTRUCTION COMPANY
818 Jules St. St. Joseph, Mo.
ADams 3-2597

2—Caterpillar D9 tractors with rear double drum power control units, "C" frames and push cups. new August, 1957

1—Caterpillar D9 tractor with push plate only. new January, 1956

1—Caterpillar D9 tractor with rear double drum power control unit and cable dozer. new March, 1956

3—Caterpillar DW21's. 2-new 1956, 1 new 1955.

5—Seaman-Andwall pulverizers with GMC diesel engines. 4" water pumps. 1956 machines.

All of the above are in excellent operating condition and are at present working in the Chicago area. They may be inspected at any time.

1—International TD24 with rear power control unit and cable dozer. An older machine, but in good operating condition. Make us an offer on this one.

Allis-Chalmers model TS360 motor scrapers. These have been completely rebuilt and are ready to go.

Allis-Chalmers HD-21's. One with Hydraulic dozer and Tractomotive ripper. Two with cable dozers and rear power control units. All rebuilt and guaranteed.

2—Bucyrus-Erie model 22-B ¾-yd. combination dragline and clamshell. 50' boom, GMC diesel engine.

All of the above equipment is located at Hillside, Illinois and is in very good operating condition. It may be inspected at any time.

Write, Wire or Phone

D. D. KENNEDY, INC.
P. O. Box 177 Bellwood, Ill.
Chicago: AU 7-4300 Suburban: LI 4-5600

AT DALLAS

HO Hough payloader, serial #22C1376, practically new.
TD-9 IHC tractor w/9K3 Drott loader, serial #53576, reconditioned.
TD-14 IHC tractor w/Drott bullclam, serial #35315, reconditioned.
75 IHC payscraper, serial #631, good condition.
10-B Bucyrus-Erie shovel attachment, fair condition.
255 P & H clamshell, 35-ft. boom, serial #So462500, fair condition.

AT HOUSTON

1—Insley K-12, ½-yd. dragline, s/n 3420, Chrysler gas engine, 35-ft. boom, 24-in. shoes, item B-760, as is.
1—Bucyrus-Erie 15-B backhoe, s/n 59821, UD-9 diesel, mounted on tractor type tracks, as is.
1—Bucyrus-Erie 22-B clamshell and dragline, 40-ft. boom, s/n 96266, IHC UD-14A, item 695, reconditioned.
1—Schield Bantam M-47 dragline (mounted on 6 x 6 G-1 truck), 30-ft. boom and Erie ⅜-yd. clamshell bucket, item B-708, as is.
1—Lorain TL-25, ¾-yd. backhoe, s/n 23276, Cat D-315, 22-in. shoes, item B-702, as is.
1—Cleveland 95 s/n 3398, gasoline engine, option 4, 10-in. track shoes, reconditioned.
1—Insley backhoe attachment (for model L ¾-yd.). s/n M-45401, item B-761, as is.

BROWNING-FERRIS MACHINERY CO.
305 Exposition Ave. 2619 Texas Ave.
Dallas, Tex. Houston, Tex.

¾ cu. yd. slightly used, type AX, medium duty dragline bucket complete with fittings. Weight 1,900 pounds. Special reduced price $916. F.o.b. Bellwood, Ill.

BUCYRUS-ERIE COMPANY
Evansville, Indiana

EQUIPMENT WANTED

Hoe attachment for Lorain L50-I, 1-yd. machine; state price, age and condition.

SYRACUSE SUPPLY CO.
294 Ainsley Drive Phone: GR 8-3157
Syracuse, N. Y.

HELP WANTED

Experienced driller, bilingual Spanish/English, willing to travel extensively in Mexico, Central and South America working as serviceman, instructor and demonstrator on water well, shallow oil well and blast hole drilling equipment, both cable tool and rotary. Reply giving resume of education, experience, age, marital status, salary expected, etc., to Box 3738.

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EXCAVATING

ENGINEER

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Notes from the Manufacturers

Allis-Chalmers Mfg. Co., Milwaukee, Wis. has appointed Ralph L. Haney as manager of the Philadelphia (Pa.) district and Charles E. Dandois as manager of the Allentown (Pa.) district of the A-C Industries Group. At Philadelphia, Haney succeeds C. W. Parker, Jr., recently named director of sales promotion for the industries group. Haney had been manager at Allentown since November 1956. Prior to that he was a sales representative in the firm's Boston (Mass.) district for 10 years. Dandois had been a sales representative in the Allentown district since 1957. He has been with Allis-Chalmers since 1949.

Bucyrus-Erie Co., South Milwaukee, Wis., has appointed Lounsbury Co., Ltd., Moncton, N. B., Canada, as a distributor in the province of New Brunswick. The firm will offer sales and service on the full line of ⅜ to 4-yd. convertible excavators and cranes; 10, 15, 25 and 35-ton capacity Transit Cranes; 5 and 12-ton capacity truck-mounted, all-hydraulic Hydrocranes; ⅜ and ½-yd. Hydroshoes and Hydroshovels; dragline buckets; 2½ to 8-yd. Ward Leonard electric shovels; walking draglines with diesel or electric power; cable tool and rotary blast hole drills; bit dressers; and railway cranes. In addition, Lounsbury Co. also will handle the Canadian-built ¾-yd. 22-B and the 1-yd. 30-B. Both of these machines are manufactured in the new plant of Bucyrus-Erie Co. of Canada, Ltd. at Guelph, Ont. Parts and servicing facilities are maintained at the distributor's plant, 15 Bacon St., Moncton, and at its Fredericton and Campbellton operations.

Construction Machinery Div., Clark Equipment Co., Benton Harbor, Mich., has appointed Dan B. Daily a district representative. His territory will include Wisconsin, upper Michigan, Minnesota, North Dakota, Manitoba and western Ontario. Daily was a district manager for the Frank G. Hough Co. prior to coming to Clark in March. He will make his headquarters in Lakeville, Minn.

Crosby-Laughlin Div., American Hoist & Derrick Co., Fort Wayne, Ind., is now headed by George F. Manikas, general manager. Manikas is responsible for all phases of the operation of the division, which manufactures a complete line of drop forged fittings for wire rope and chain. A veteran employee of many years service, Manikas joined American Hoist at its South Kearny (N.J.) plant in 1923. For the past several years, he has been district manager for the Crosby-Laughlin division in charge of east coast sales.

Esco Ltd., Port Coquitlam, B. C., has placed new foundry facilities in full production. The firm is a Canadian subsidiary of Electric Steel Foundry Co., Portland, Ore. The foundry, one of the most modern in Canada and the United States, will supply Esco Ltd. with alloy steel castings from one-half to 5,000 pounds in weight. Construction on the Port Coquitlam plant was started a year ago and the firm poured its first trial heat in February. Facilities include electric arc furnaces, together with modern heat treating and quenching units. Esco Ltd. manufactures a full line of products used in logging, construction, chemical process industries and others. All items, either cast or fabricated, are sold across Canada through the Esco sales organization. Offices and warehouses are located in Montreal, Que., Toronto, Ont. and Vancouver, B. C., with resident salesmen and dealers in the other major parts of Canada.

Hank Roesler
EXCAVATING ENGINEER

"Only yesterday he turned down a softer job with more pay."

Euclid Div., General Motors Corp., Cleveland, Ohio, has authorized Brooks Machinery, Inc., Marietta, Ga., as dealer for Euclid scrapers, rear and bottom-dump haulers and crawler tractors in northern Georgia. Territory of the dealer consists of all counties north of and including Chattahoochee, Marion, Schley, Macon, Houston, Twiggs, Wilkinson, Washington, Jefferson and Burke except the four northwestern counties of Dade, Catoosa, Whitfield and Walker. The firm's temporary location is at 202 N. Four-Lane Highway in Marietta. New facilities are under construction in the immediate vicinity. A former Euclid district representative in the Southeast, W. H. Schwagmeyer, is joining the new dealership as vice-president. G. M. Brooks is president of the company. Other management personnel includes D. L. Volkert, secretary and treasurer and Harold Winborne, parts and service manager.

Koehring Co., Milwaukee, Wis., has named Philip E. Cunningham new product manager for its excavator line. Before his appointment, Cunningham was employed by a construction equipment distributor in Wisconsin. He served with Koehring as a district representative 1947–50. Koehring has also appointed Edward R. Gee, Philadelphia, Pa., to serve as a district representative for the northeastern United States.

L. B. Foster Co., Pittsburgh, Pa., has named Tore Wistedt as general manager of Foster International Corp., a Foster affiliate. The appointment is part of a general expansion of Foster's overseas services. Wistedt has been associated with international marketing of steel products for more than 20 years. Before joining Foster this year, he was president of American Ferrox Corp., and prior to that he served as president of Edstrand Brothers, Inc. Following the war, Wistedt operated his own import-export firm specializing in steel mill products. He will make his headquarters in New York City.

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Are you getting maximum life from your wire rope?

You can lengthen the service life — and lower the yearly cost — of your wire ropes by using the *correct* Whyte Strand Wire Rope for each piece of equipment.

What do we mean by correct? Well — all wire rope isn't alike. The demands of dragline service are different from those on scrapers or shovels. But whatever the requirements — no matter how tough the job — there's a Whyte Strand Rope specially designed to withstand the particular abuses of *each* kind of service. What's more, we'll be glad to recommend which of Macwhyte's thousand-and-one ropes is the *best* for *your* kind of job.

All Whyte Strand ropes are internally lubricated by a special process which individually coats every wire . . . every strand . . . with a tough, tenacious lubricant coating. This increases the rope's flexibility, reduces internal wear, and provides excellent corrosion resistance.

Ask your Macwhyte distributor for help in getting maximum service life from your wire rope. He'll be glad to give you a correct rope recommendation for each rope on every piece of your equipment. Don't guess when you can be sure. Call him today!

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Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel, Plastic Coated and Nylon Coated Wire Rope, and Wire Rope Assemblies. Special catalogs available.

MILL DEPOTS: New York 4, 35 Water St. • **Pittsburgh 36,** P. O. Box 10916, 353 Curry Hollow Road • **Detroit 3,** 75 Oakman Blvd. • **Chicago 6,** 228 S. Desplaines St. **St. Paul 14,** 2356 Hampden Ave. • **Ft. Worth 1,** P. O. Box 605 • **Portland 9,** 1603 N. W. 14th Ave. • **Seattle 4,** 87 Holgate St. • **San Francisco 7,** 188 King St. • **Los Angeles 33,** 185 South Myers Street.

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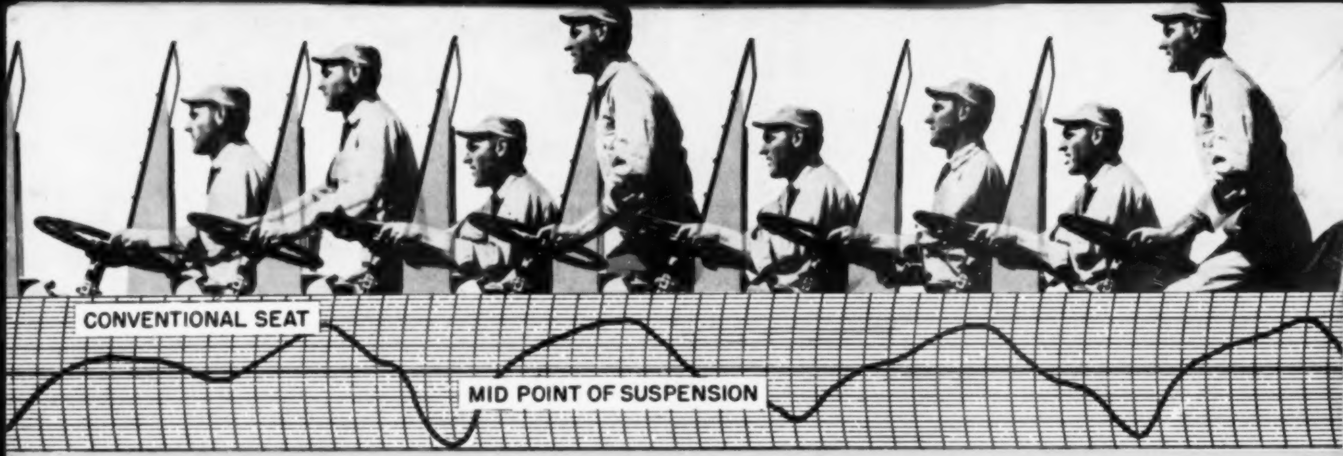
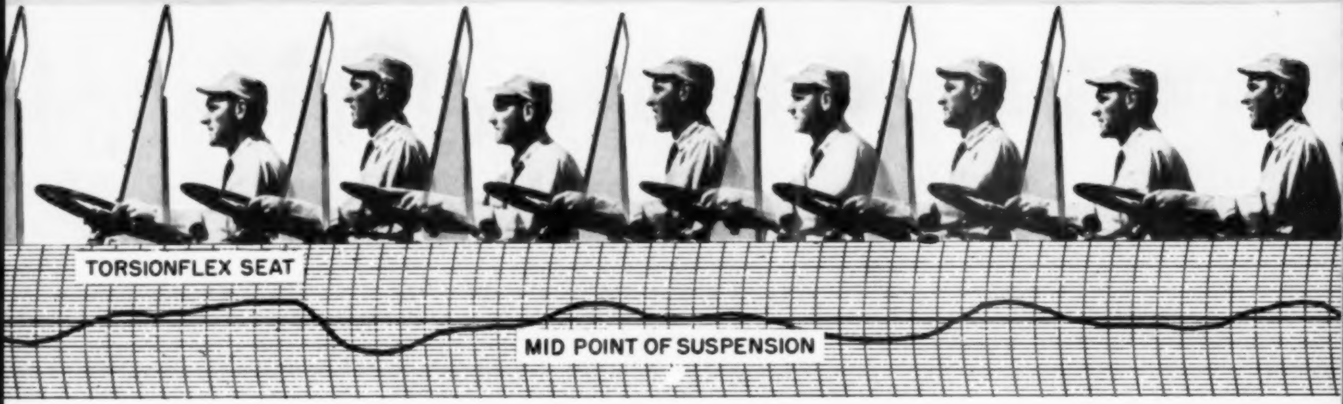


Operator efficiency increases with . . . the new Caterpillar Torsionflex Seat



New Torsionflex Seat for Caterpillar wheel Tractors increases operator efficiency and comfort—provides a "highway" ride in off-highway conditions. Note the difference between the ride in the Torsionflex Seat and the conventional seat, as illustrated by this graph made over the same rough test course.

The Torsionflex Seat is just one of many new features introduced by Caterpillar to help increase earthmoving production!

Over the years Caterpillar has been the leader in improving earthmoving equipment with one aim in mind: *to move more dirt faster at lower cost.* No advance, from strengthening a 7-pound piston to redesigning a 30-ton rig, has been overlooked to increase the efficiency of Caterpillar-built machines, as well as the efficiency, comfort and safety of the men who operate them!

Now, in the new Torsionflex Seat, Caterpillar introduces a new concept in wheel tractor seat suspension—to give the operator maximum comfort over the roughest terrain. The new seat conserves his energy, lessens his fatigue, enables him to do more work per shift.

Test course proves superiority of Torsionflex Seat

The graph here shows the improved ride made possible by the Torsionflex Seat. Two rubber-tired machines, one with this new seat and the other with the conventional seat, were run over the same rough test course at the same speed. The lines in the graph were plotted by instruments attached to the operator. The horizontal component of the lines represents forward travel by the operator, while the vertical component represents his up and down motion. Note the big difference in the ride!

The new seat is just one of many improvements, large and small, being made constantly by Caterpillar throughout its line—tractors, scrapers, motor graders, other earthmovers. For modern, heavy-duty equipment that will increase your production and lower your costs, see your Caterpillar Dealer!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

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